PRESENTED BY
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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SAMS PHOTOFACT* SET No. 376

*TRADEMARK

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The PHOTOFACT Servicer

Set 376..Vol. 38 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ Nov. 1, 1957

The service information in this Servicer provides data on models which we have been unable to present in PHOTOFACT Folders. The receivers are not in current production; a requirement for PHOTOFACT coverage, and we are therefore presenting schematics and supplementary data that will be of assistance when servicing these models.

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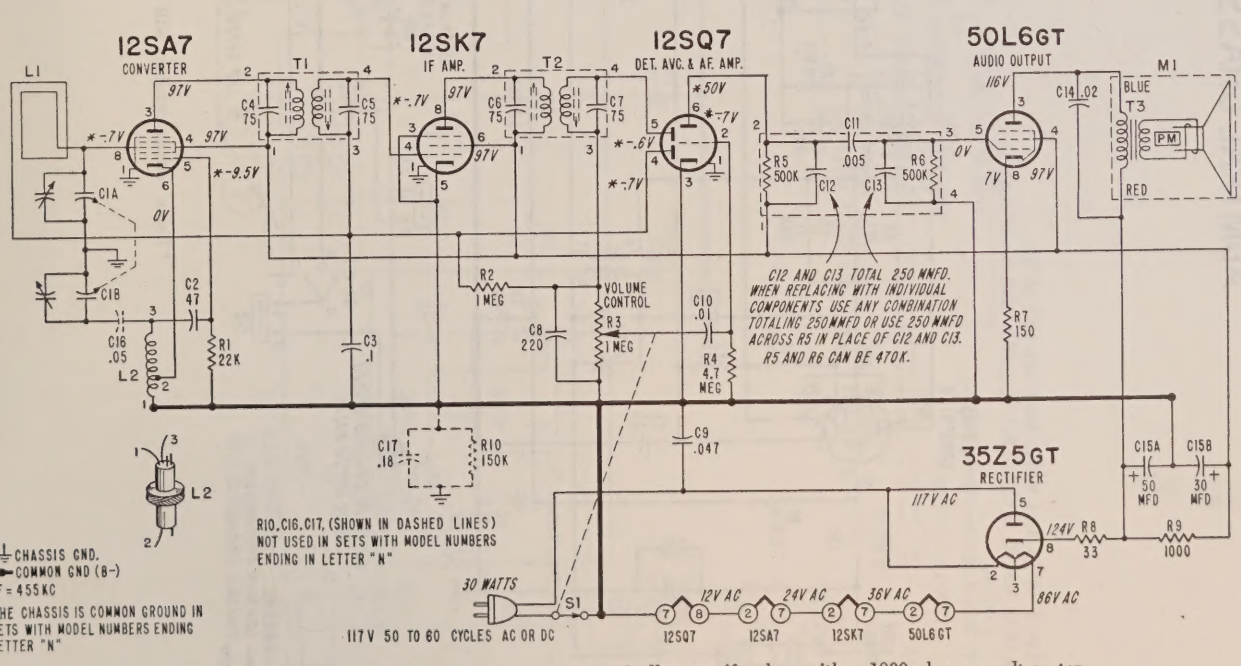
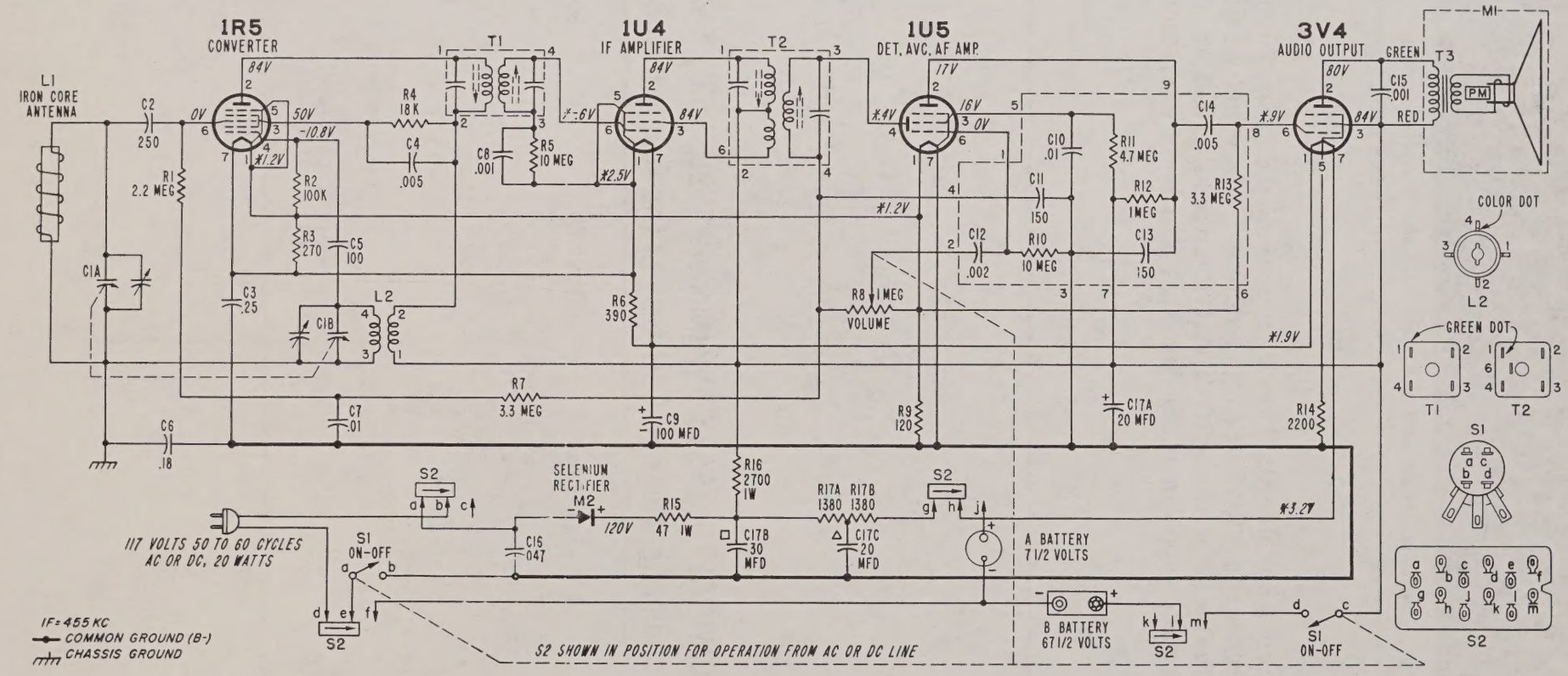
ADMIRAL CHASSIS 5S2 (Models 5S21, 5S22, 5S23)

Schematic Diagram Courtesy of the Admiral Corp.



*These voltage readings will be either lower or practically zero if taken with a 1000 ohm-per-volt meter.

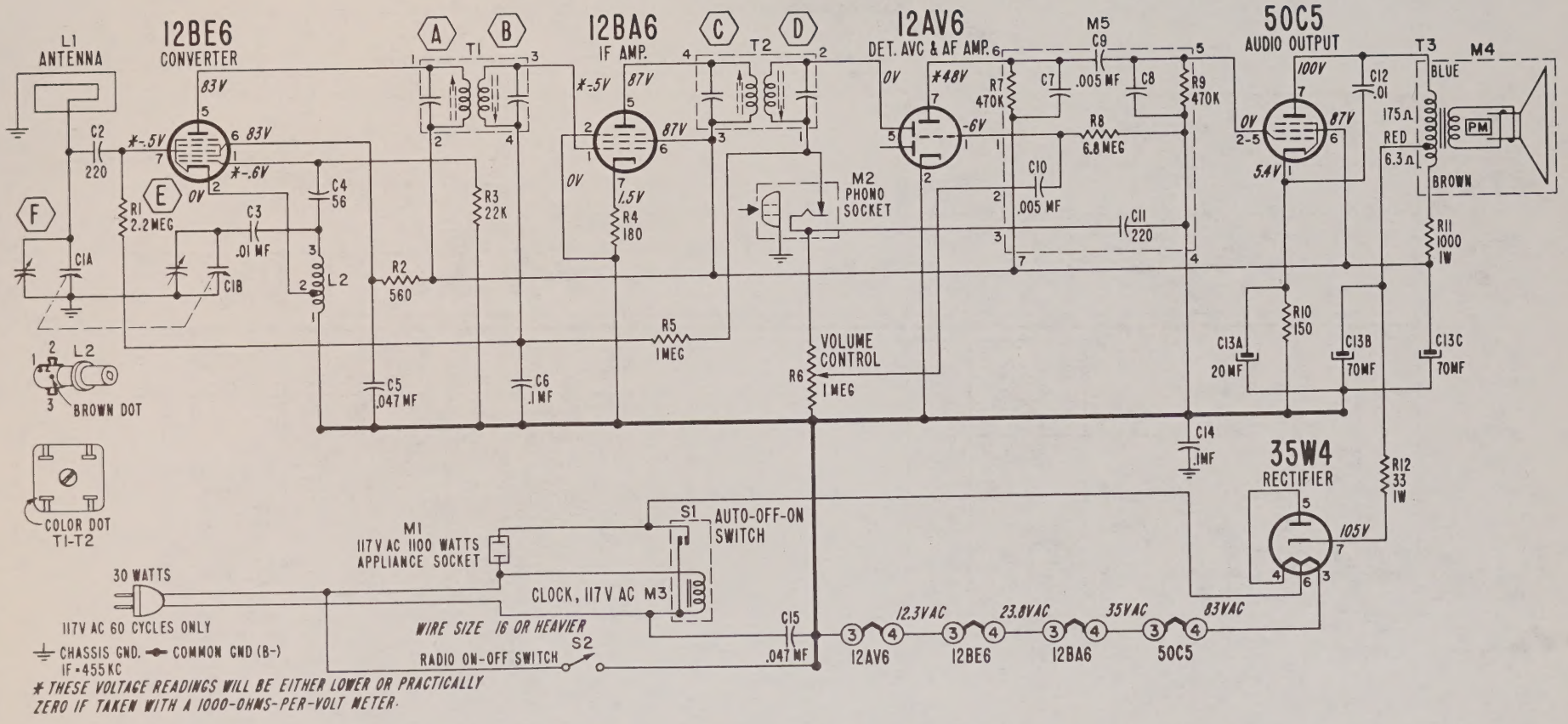
ADMIRAL CHASSIS 4Y1 (Models 4Y11, 4Y12, 4Y18, 4Y19)



*These voltage readings will be either lower or practically zero if taken with a 1000 ohms-per-volt meter.

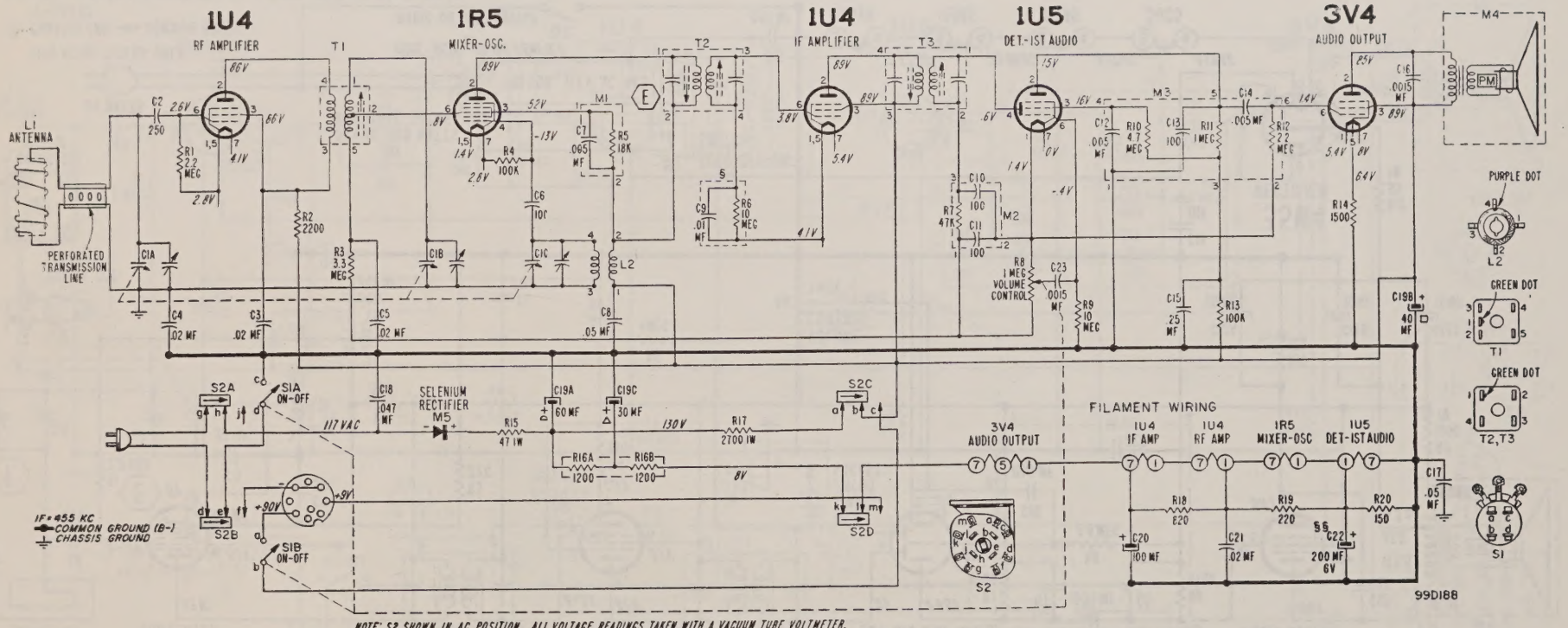
Schematic Diagram Courtesy of the Admiral Corp.

ADMIRAL CHASSIS 5A4 (Models 5A42, 5A43, 5A44, 5A48)



Schematic Diagram Courtesy of the Admiral Corp.

ADMIRAL CHASSIS 5K3 (Models 5K31, 5K32, 5K34, 5K38, 5K39)



NOTE: S2 SHOWN IN AC POSITION. ALL VOLTAGE READINGS TAKEN WITH A VACUUM TUBE VOLTMETER.

§ IN EARLY MODELS, C9 AND R6 WERE A COUPLATE. REPLACE COUPLATE WITH INDIVIDUAL COMPONENTS.

§§ IN EARLY MODELS, C22 WAS .1 MF, 200 VOLT PAPER. REPLACE WITH 200 MF, 6 VOLT ELECTROLYTIC CAPACITOR

Schematic Diagram Courtesy of the Admiral Corp.

PHOTOFACT* Folder
*TRADE MARK

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 11 IN SET 357

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DENVER, COLORADO

Webcor Model 2718 was covered in Photofact Folder 11 – Set 357.

Model 2719 is added with the publication of this bulletin.

COMPARISON OF MODELS 2718 and 2719

Both models are identical in basic design and construction with the exception that Model 2719 is a remote control version of Model 2718. Electrical and mechanical adjustments are the same for both models. A partial schematic showing the solenoid and remote jack is given in Fig. 1.

The service manual Webcor Model 2718 in Set 357 – Folder 11 will cover both mechanical and electrical problems and adjustments. Operating instructions included in this manual will suffice to check the units for overall performance.

Webcor Tape Recorders are accurately adjusted, lubricated and tested at the factory. However, adjustments in the field will be necessary if parts are replaced or if specific troubles indicate misadjustment. A listing of possible troubles and remedies has been included. Although the trouble encountered in actual service may not be identical to that listed, some association may be established which will assist in locating the actual trouble.

OPERATING INSTRUCTIONS - MODEL 2719

The Webcor Viscount Tape Recorder Model 2719 is the remote control version of the Webcor Viscount Tape Recorder Model 2718. Model 2719 is designed for use with Webcor Remote Control Microphone A-2946-1, Remote Control Foot Pedal 2947-1, standard microphone and Webcor Earphones A-2918. Before using either remote control microphone, foot pedal or earphones, read the operating instructions for Model 2718.

OPERATION WITH FOOT PEDAL A-2947-1

1. Insert foot pedal plug into "Remote" jack located at rear of recorder.

2. Insert microphone plug into "Input" jack located at rear of recorder. Webcor microphone 2930-E and remote control microphone 2946-1 may be used with the remote control foot pedal.

3. Turn master control knob (6) to "Record" position and at the same time push the "Record" safety lock button (8) forward. If the machine begins to operate, step on the foot pedal, it will place machine in neutral. When ready to start recording, depress and release foot pedal lever, which will start recorder. To stop recorder, depress and release foot pedal the second time.

4. The remote control foot pedal may also be used to "start" and "stop" the tape at any time while the recorder is in the "play" position.

CAUTION: Do not use the foot pedal to stop the recorder when it is in "Fast Forward" or tape breakage may result.

5. After a recording has been made, follow the standard "rewind-playback" operating procedure.

NOTE: Webcor Earphone 2918 may be used for taking notes from recordings. The earphones may be used with either the Remote Control Microphone or Foot Pedal.

To use earphones, plug earphone plug into "Output" jack on rear of recorder and adjust volume as desired.

WEBCOR MODEL 2719

(Con't on reverse side)

PRODUCTION CHANGES
BULLETIN 191

PRODUCTION CHANGES
BULLETIN 191

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1957 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

FOLDER 1

OPERATING WITH REMOTE CONTROL MICROPHONE MODEL A-2946-1

1. Insert the silver metal microphone plug into the "Input" jack located on rear of recorder. Place the black bakelite plug in the "Remote" jack.

2. Turn master control knob (6) to "Record" position and at the same time push the "Record" safety lock button (8) forward.

3. Depress the button on the remote control microphone. This will start the recorder. If desired, the button may be pushed in and up. This will lock the button in position and the machine will continue to run until the button is pushed down and released.

4. After a recording has been made, follow the standard "rewind'-playback" operating procedure.

CAUTION: Do not use the remote control microphone to stop the recorder when it is in "Fast Forward" or tape breakage may result.

PARTS USED ON MODEL 2719 ONLY

Ref. No.	Part No.	Description
114	26P1047	#8-32 x 3/8" H. H. Sems M. Screw
115	25P379	Washer
116	41P1679	Tapped Post
117	11X1841	Solenoid, Pin and Spring Assy.
118	26P892	#6-32 x 1/4" P.R. R. H. S. T. Screw
119	25P288	Washer
120	50P342	Retainer Ring

An exploded view showing the mechanical parts used in Model 2719 is given in Fig. 2.

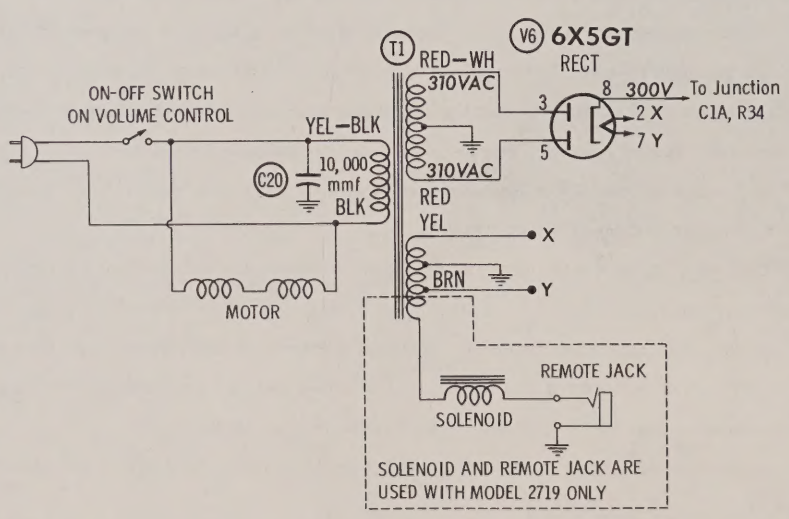
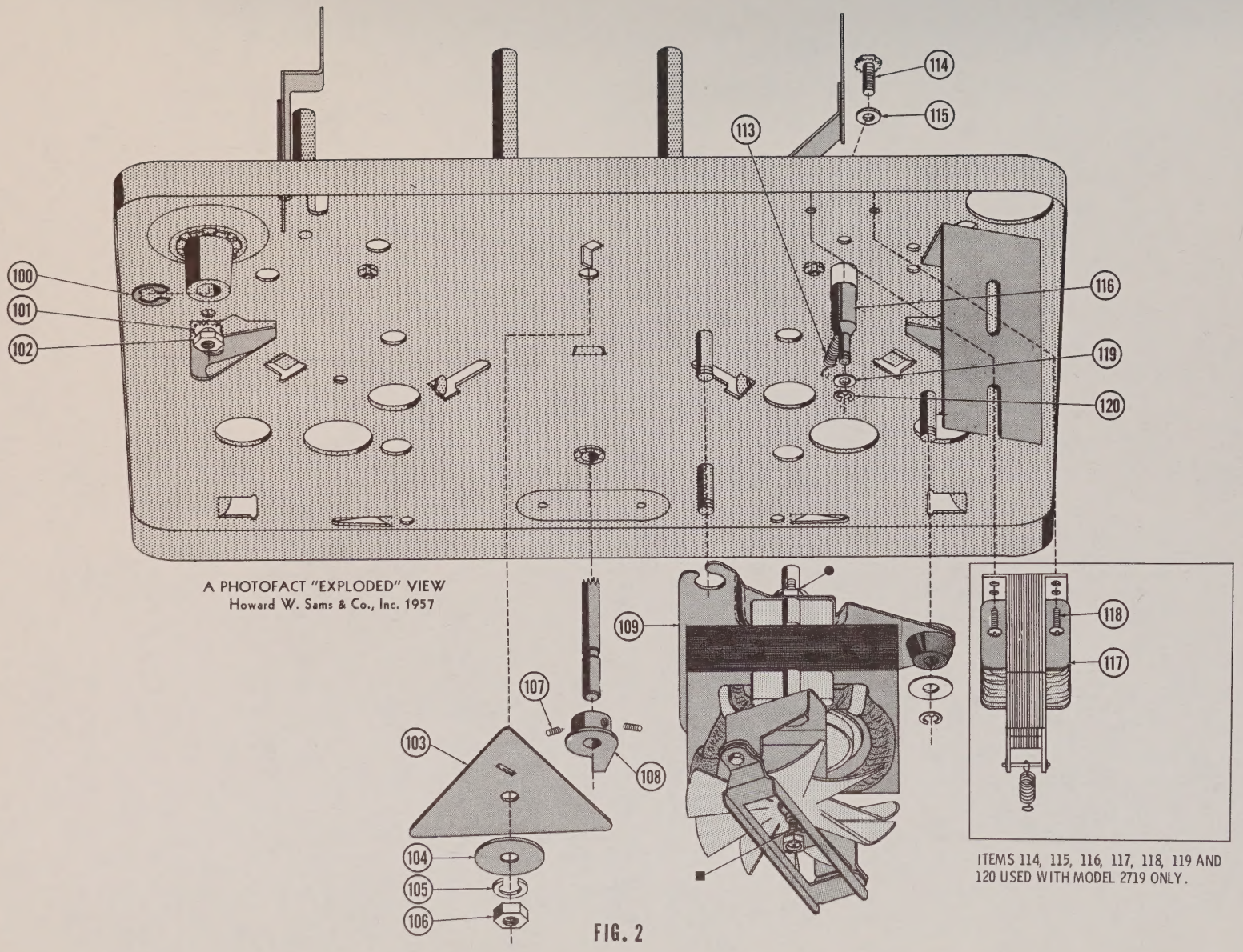


FIG 1


100
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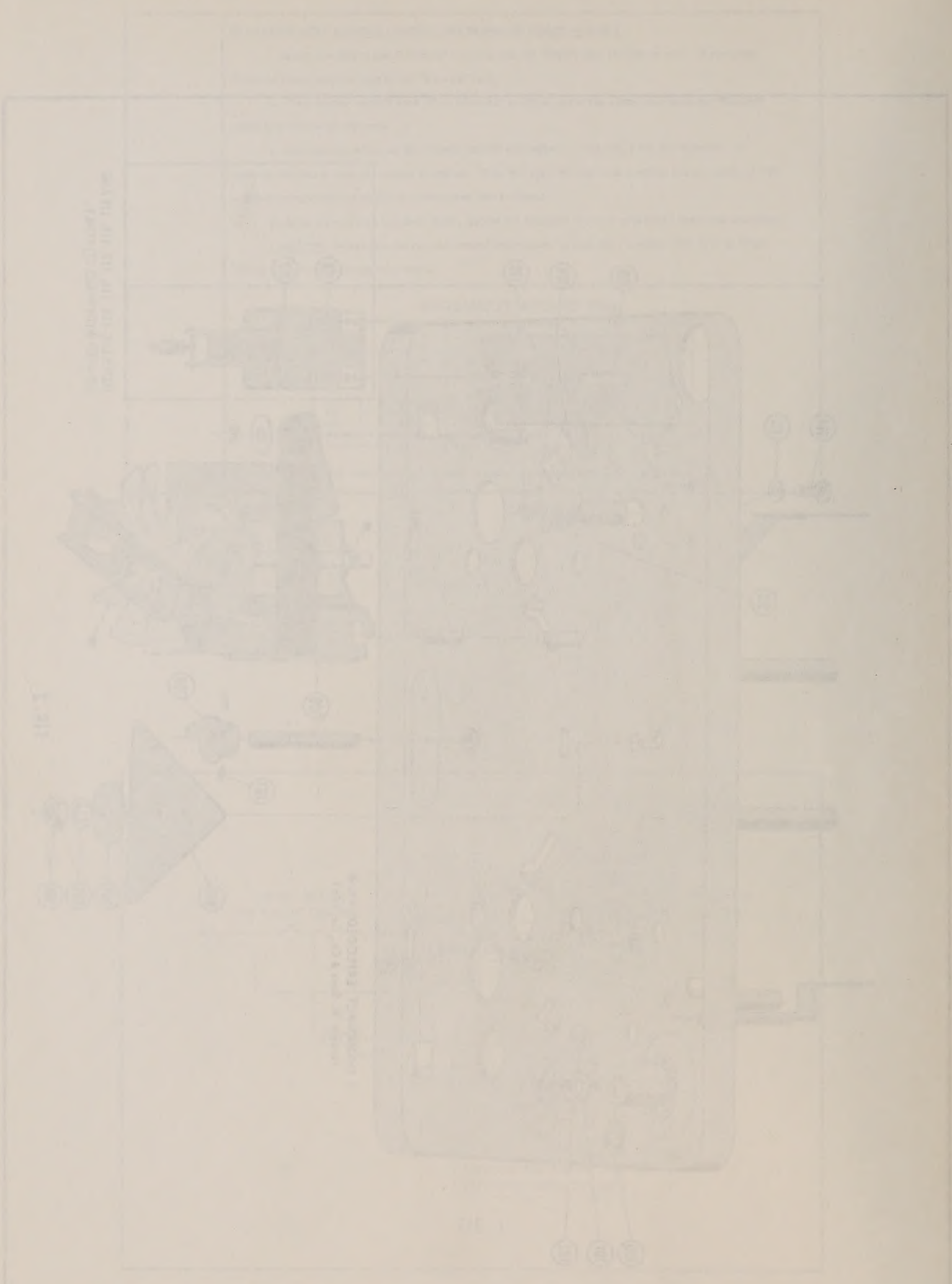
A PHOTOFACT "EXPLODED" VIEW
Howard W. Sams & Co., Inc. 1957
ITEMS 114, 115, 116, 117, 118, 119 AND 120 USED WITH MODEL 2719 ONLY.

FIG. 2



PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER RADIO-ELECTRONICS-TELEVISION MANUFACTURERS ASSOCIATION

HOFFMAN MODELS B3191, U, M3181, U, SP3181, U (Ch. 420, U)

PROPERTY OF
L. F. TELEVISION SHOP
[illegible] S.
DENVER, COLORADO

MODEL M3181U (Ch. 420U)

HOFFMAN MODELS B3191, U, M3181, U, SP3181, U (Ch. 420, U)

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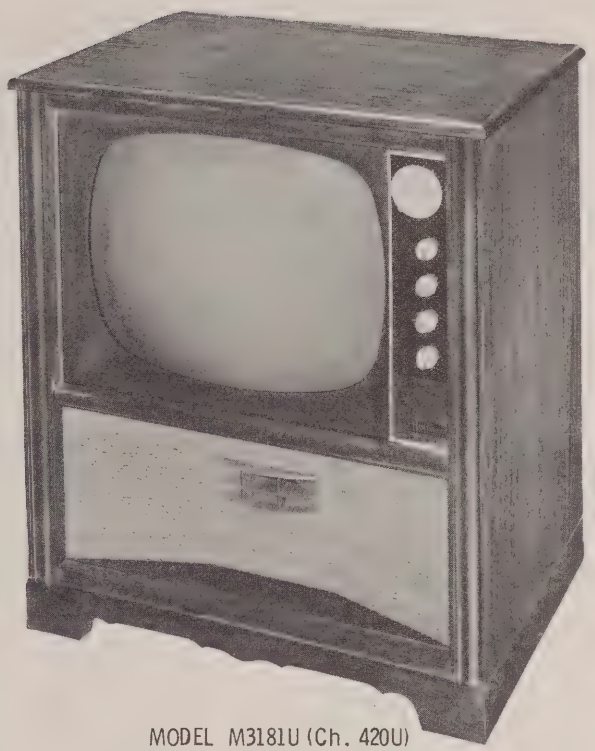
FOLDER 2

HOFFMAN MODELS B3191, U, M3181, U, SP3181, U (Ch. 420, U)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 9 push-on type control knobs from the front.
2. Remove 7 wood screws, 1 metal screw and the rear cover.
3. Remove the picture tube socket, yoke plug, HV lead, 3 speaker leads and the antenna terminal leads.
4. Remove 1 wood screw from the upper support bracket.
5. Remove 2 chassis bolts from the bottom.
6. Remove the chassis.
7. Remove 10 speaker screws and 3 speakers.



MODEL M3181U (Ch. 420U)

PROPERTY OF
L. F. [illegible]SHIP
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DENVER, COLORADO

TRADE NAME	Hoffman	MODELS	CHASSIS
		B3191, M3181, SP3181	420
		B3191U, M3181U, SP3181U	420U
MANUFACTURER	Hoffman Radio Corp., 6200 S. Avalon Blvd., Los Angeles 3, Calif.		
TYPE SET	Television Receiver		
TUBES	Twenty-three		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 265 Watts, 2.4 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 9 push-on type control knobs from the front. Remove 4 wood screws, escutcheon and metal trim. Remove the safety glass.

FOCUS

The focus may be varied by means of a screw in the centering magnet. Using a non-ferrous screwdriver adjust for best focus.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The horizontal frequency coil is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally. (For location, see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (A3) located on top of chassis.

CENTERING

Centering is accomplished mechanically by means of a centering arm. Adjust the arm from side to side, and up and down until the picture is properly centered.

HOFFMAN MODELS B3191, U, M3181, U, SP3181, U (Ch. 420, U)

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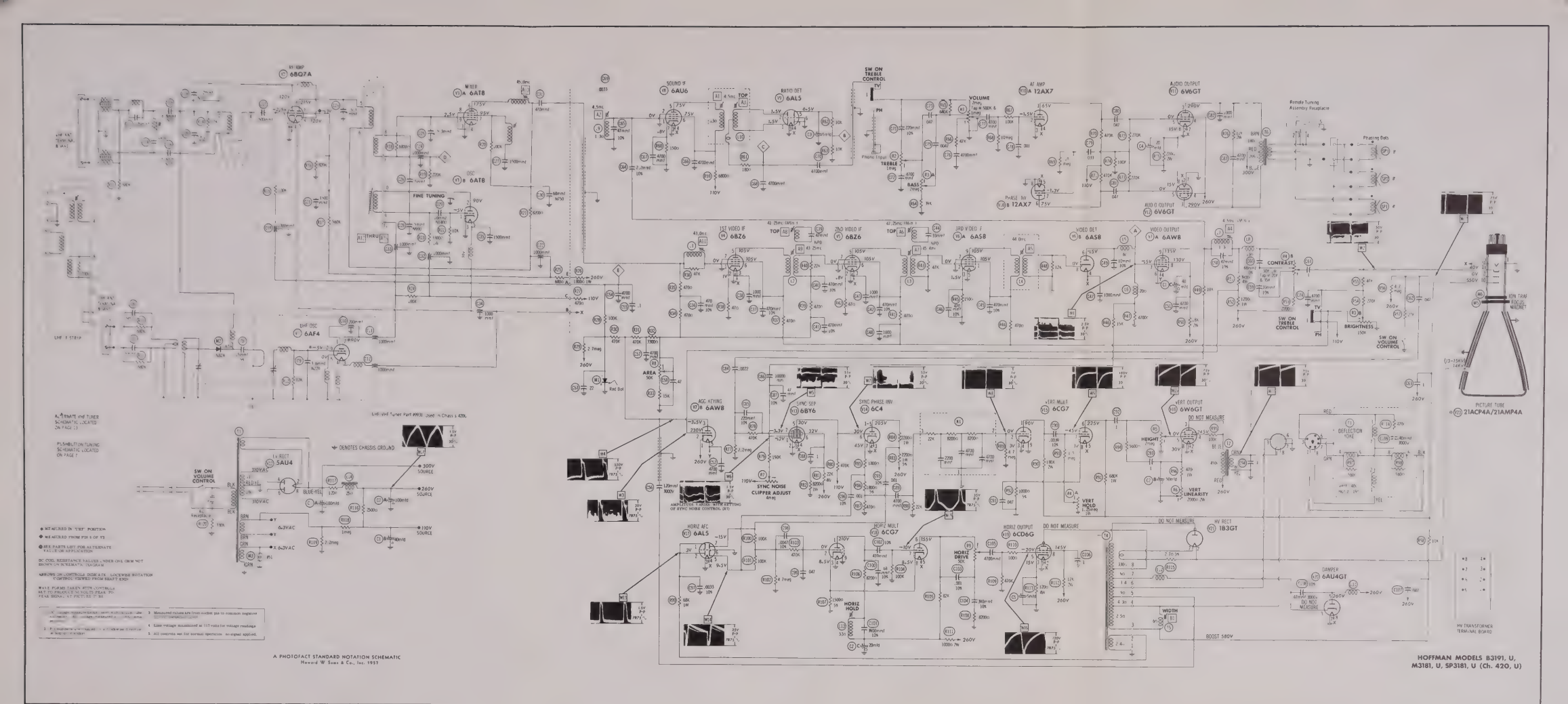
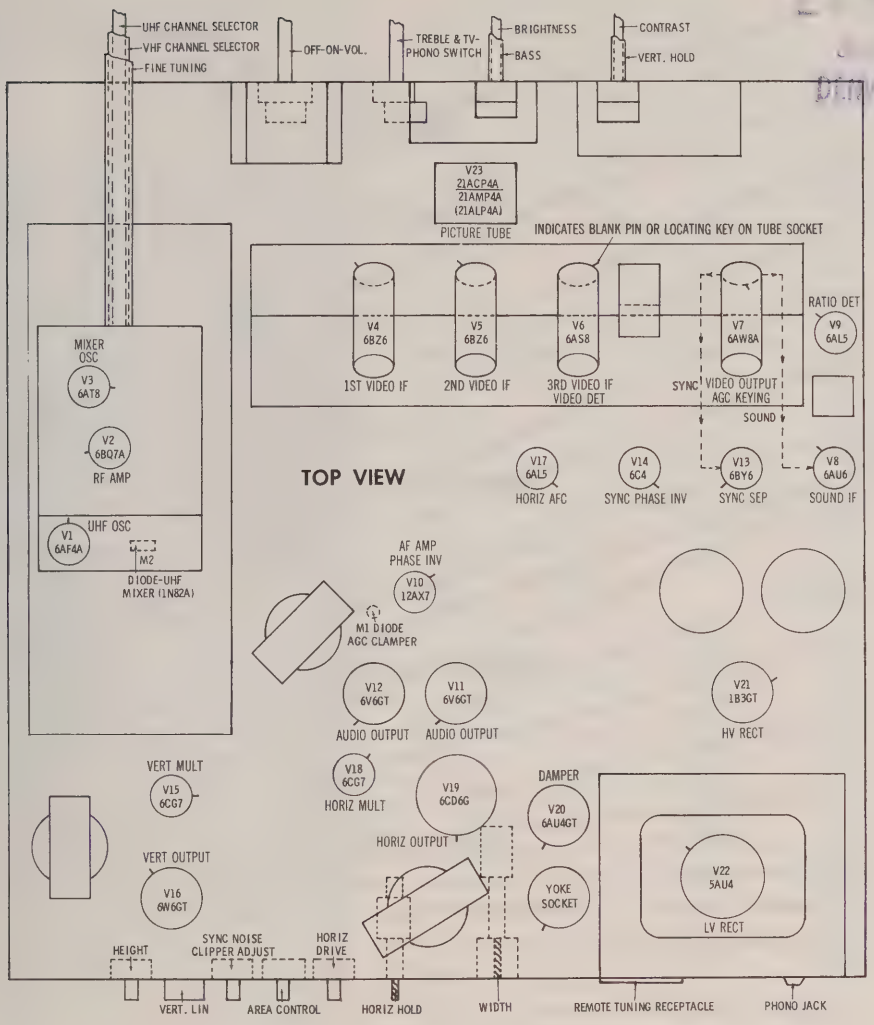

HOFFMAN MODELS B3191, U, M3181, U, SP3181, U (Ch. 420, U)
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957
PICTURE TUBE 21ACP4A/21AMP4A
HV TRANSFORMER TERMINAL BOARD
DENOTES CHASSIS GROUND
SW ON VOLUME CONTROL
SW ON TREBLE CONTROL
FINE TUNING
BRIGHTNESS
CONTRAST
HEIGHT
WIDTH
VERT LINEARITY
HORIZ HOLD
VERT HOLD
SYNC NOISE CLIPPER ADJUST
AREA
BOOST 580V
DO NOT MEASURE

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

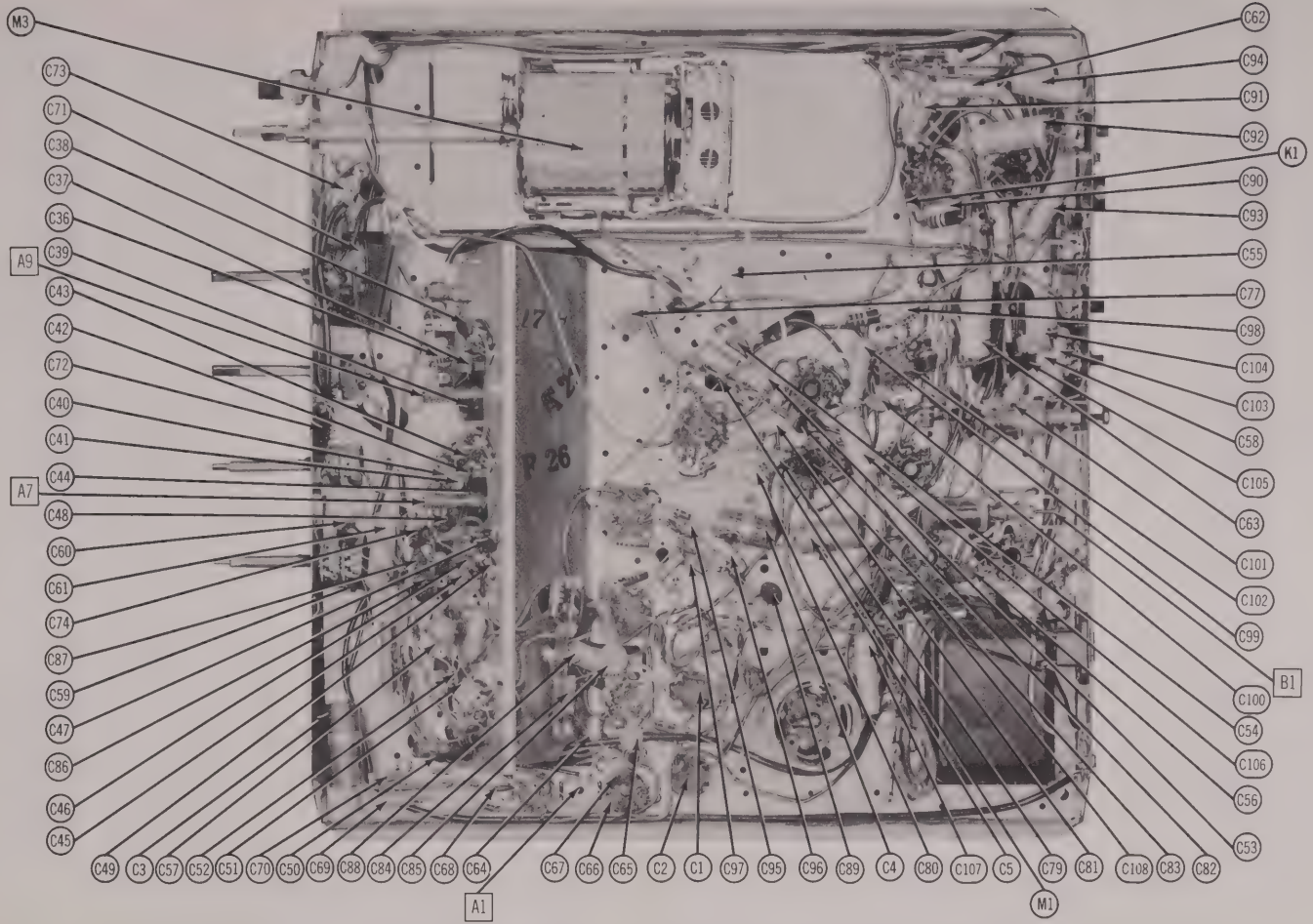
The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V22

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V4, V5, V6, V7
No pic, no sound, has snow - V2, V3, V4, (V1 UHF only)
No pic, has sound, has raster - V7, V23
Has pic, no sound - V8, V9, V10, V11, V12
Overloaded picture - V7, Diode (M1)

SYNC FAILURE
No vert. sync - V13, V14
No horiz. sync - V13, V14, V17
No vert. or horiz. sync - V13, V14

SWEEP FAILURE
No raster, has sound - V17, V18, V19, V20, V21, V23
No vertical deflection - V15, V16
Poor vert. linearity or foldover - V15, V16
Poor horiz. linearity or foldover - V18, V19, V20
Narrow picture - V18, V19, V20, V22
Vert. off freq. - V15
Horiz. off freq. - V18



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.

SOUND IF ALIGNMENT

Use only enough generator output to provide a usable indication on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.005MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point (B). Common to chassis.	A1, A2	Adjust for maximum deflection.
2.	"	"	"	"	DC probe to point (B). Common to point (C).	A3	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
3.	.005MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru detector (Fig.1) to pin 11 (cathode) of picture tube. Common to chassis.	A4	Adjust for MINIMUM deflection.

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	1500MMF	High side to point (D). Low side to chassis.	Not used	44.0MC	Any non-interfering channel	USE VTVM. DC probe thru 10K to point (A). Common to chassis.	A5	Use only enough generator output to provide a usable indication on VTVM. Adjust for maximum deflection.
5.	"	"	"	47.25MC	"	"	A6	Adjust for MINIMUM deflection.
6.	"	"	"	45.4MC	"	"	A7	Adjust for maximum deflection.
7.	"	"	"	41.25MC	"	"	A8	Adjust for MINIMUM deflection.
8.	"	"	"	43.25MC	"	"	A9	Adjust for maximum deflection.
9.	"	"	"	43.0MC	"	"	A10	Adjust for MINIMUM deflection.
10.	"	"	"	43.0MC	"	"	A11	Adjust for maximum deflection.
11.	"	"	"	45.0MC	"	"	A10	Adjust for maximum deflection.
12.	"	"	44.0MC (10MC Swp)	42.25MC 45.75MC	"	Vert. Amp. thru 10K to point (A). Low side to chassis.		Use only enough sweep generator output to provide a usable pattern on scope. Check for response similar to Fig. 2 with markers as indicated. If necessary, retouch A5, A7, A9, A10 and A11 SLIGHTLY for desired response.

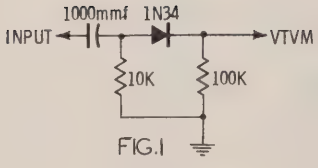


FIG.1

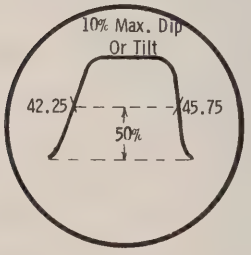


FIG.2

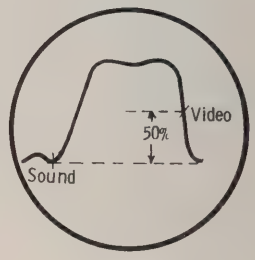


FIG.3

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to point Ⓔ . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point Ⓐ . Low side to chassis.	A12	Adjust to place sound marker in trap notch as in Fig. 3. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A13	
			201MC	199.25MC 203.75MC	11		A14	
			195MC	193.25MC 197.75MC	10		A15	
			189MC	187.25MC 191.75MC	9		A16	
			183MC	181.25MC 185.75MC	8		A17	
			177MC	175.25MC 179.75MC	7		A18	
			85MC	83.25MC 87.75MC	6		A19	
			79MC	77.25MC 81.75MC	5		A20	
			69MC	67.25MC 71.75MC	4		A21	
			63MC	61.25MC 65.75MC	3		A22	
			57MC	55.25MC 59.75MC	2		A23	

VHF RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

PUSHBUTTON TUNING ADJUSTMENT AND SERVICING

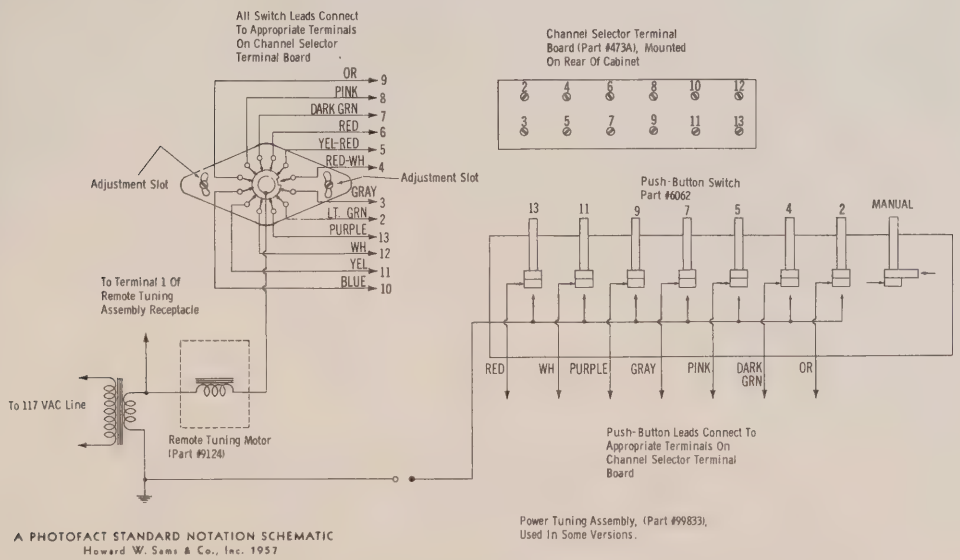
To change the channel to be selected by the power tuning assembly, remove the terminal board connection for the next lower channel and attach to the desired channels terminals. Install the correct channel pushbutton to replace the button of the channel changed.

To remove the tuning motor set the channel selector to channel 4. The wafer switch contact for channel 4 has a red and white wire attached for identification.

To check operation of the tuning assembly with the chassis removed, connect a jumper from the desired channel terminal to ground.

If wafer switch is to be removed, set the channel selector to channel 4. When replacing the switch, center the switch contacts by rotating assembly to right or left before tightening.

If the tuner stops in an "off" channel position, adjust the wafer switch to right or left to center the contact. Recheck other channels for proper operation.

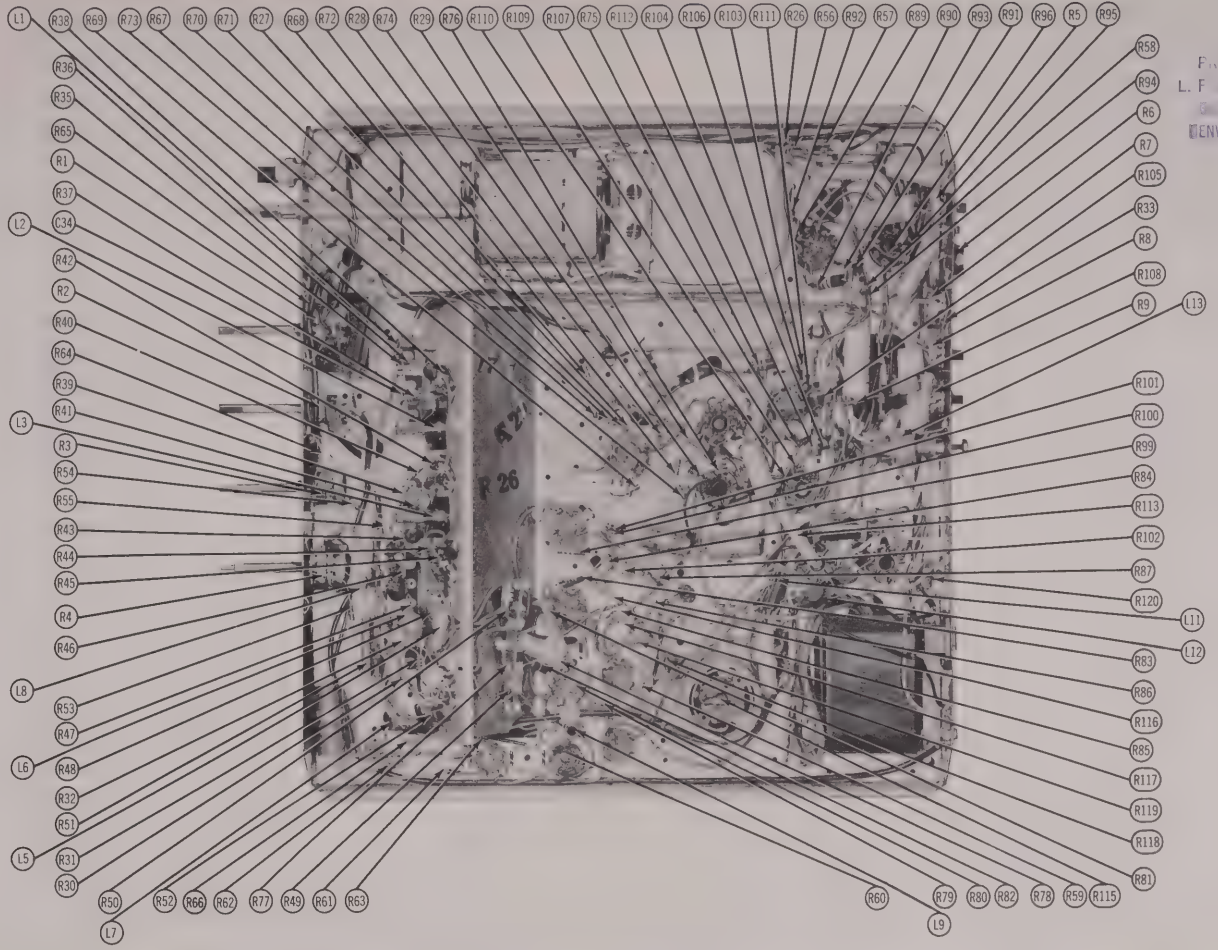


A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

PUSHBUTTON TUNING SCHEMATIC

HOFFMAN MODELS B3191, U, M3181, U, SP3181, U (Ch. 420, U)

FOLDER 2



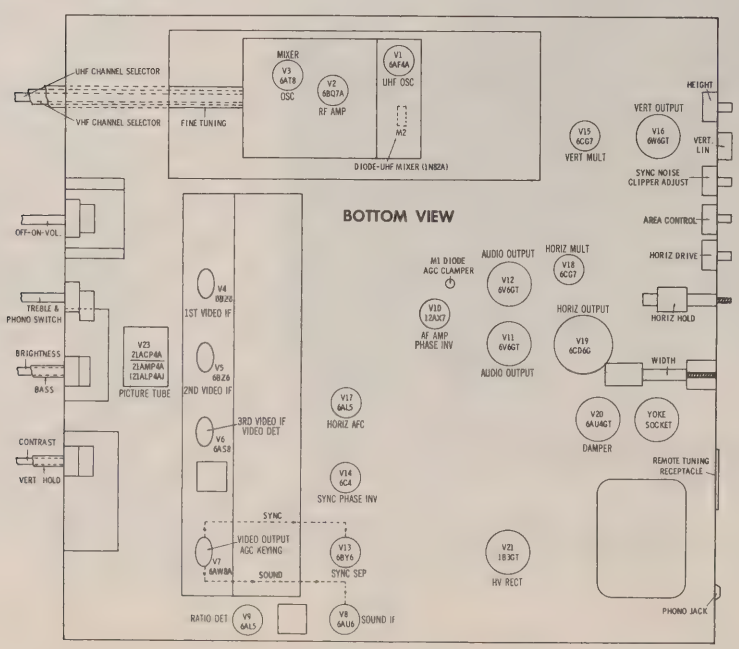
PROPERTY OF
L. F[illegible] OF
[illegible] MEADE ST.
DENVER, COLORADO

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AF4	†6600Ω	10K	.2Ω	0Ω	.1Ω	10K	†6600Ω		
V2	6BQ7A	INF	750K	0Ω	0Ω	.1Ω	†2700Ω	370K	INF	0Ω
V3	6AT8	10K	†6600Ω	0Ω	0Ω	.1Ω	†11K	†100K	0Ω	220K
V4	6BZ6	•55K	47Ω	.1Ω	0Ω	†3100Ω	†3100Ω	0Ω		
V5	6BZ6	•55K	47Ω	.1Ω	0Ω	†3100Ω	†3100Ω	0Ω		
V6	6AS8	†3100Ω	.1Ω	150Ω	.1Ω	0Ω	4700Ω	0Ω	.1Ω	†3100Ω
V7	6AW8	†145Ω	†1300Ω	•420K	650K	650K	0Ω	4700Ω	†18K	†4500Ω
V8	6AU6	1.4Ω	0Ω	0Ω	.1Ω	†9500Ω	†9500Ω	150Ω		
V9	6AL5	INF	INF	0Ω	.1Ω	20K	0Ω	0Ω		
V10	12AX7	†470K	10Meg	0Ω	.1Ω	.1Ω	†470K	10Meg	0Ω	0Ω
V11	6V6GT	NC	0Ω	†180Ω	†145Ω	370K	TP	.1Ω	270Ω	
V12	6V6GT	TP	.1Ω	†205Ω	†145Ω	370K	TP	0Ω	270Ω	
V13	6BY6	•†4Meg	0Ω	0Ω	.1Ω	†470K	†16K	2.6Meg		
V14	6C4	†4500Ω	NC	.1Ω	0Ω	†4500Ω	†470K	4100Ω		
V15	6CG7	‡190K	4.7Meg	1000Ω	0Ω	.1Ω	‡690K	•1.8Meg	1000Ω	0Ω
V16	6W6GT	NC	.1Ω	†500Ω	†600Ω	•1.1Meg	TP	0Ω	•1000Ω	
V17	6AL5	68K	68K	0Ω	.1Ω	4.8Meg	0Ω	4.8Meg		
V18	6CG7	†9300Ω	5.1Meg	1500Ω	0Ω	.1Ω	†83K	100K	1500Ω	0Ω
V19	6CD6G	NC	.1Ω	120Ω	TP	470K	TP	0Ω	†12K	TOP CAP ‡9Ω
V20	6AU4GT	NC	TP	INF	NC	†145Ω	NC	0Ω	.1Ω	
V21	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡330Ω
V22	5AU4	NC	20K	NC	11Ω	NC	10Ω	NC	20K	
V23	21ACP4A/ 21AMP4A	0Ω	18K	PIN 10 ‡10K	PIN 11 •200K	PIN 12 .1Ω				

† MEASURED FROM PIN 8 OF V22.
‡ MEASURED FROM PIN 3 OF V20.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
NC NO CONNECTION.
TP TIE POINT.

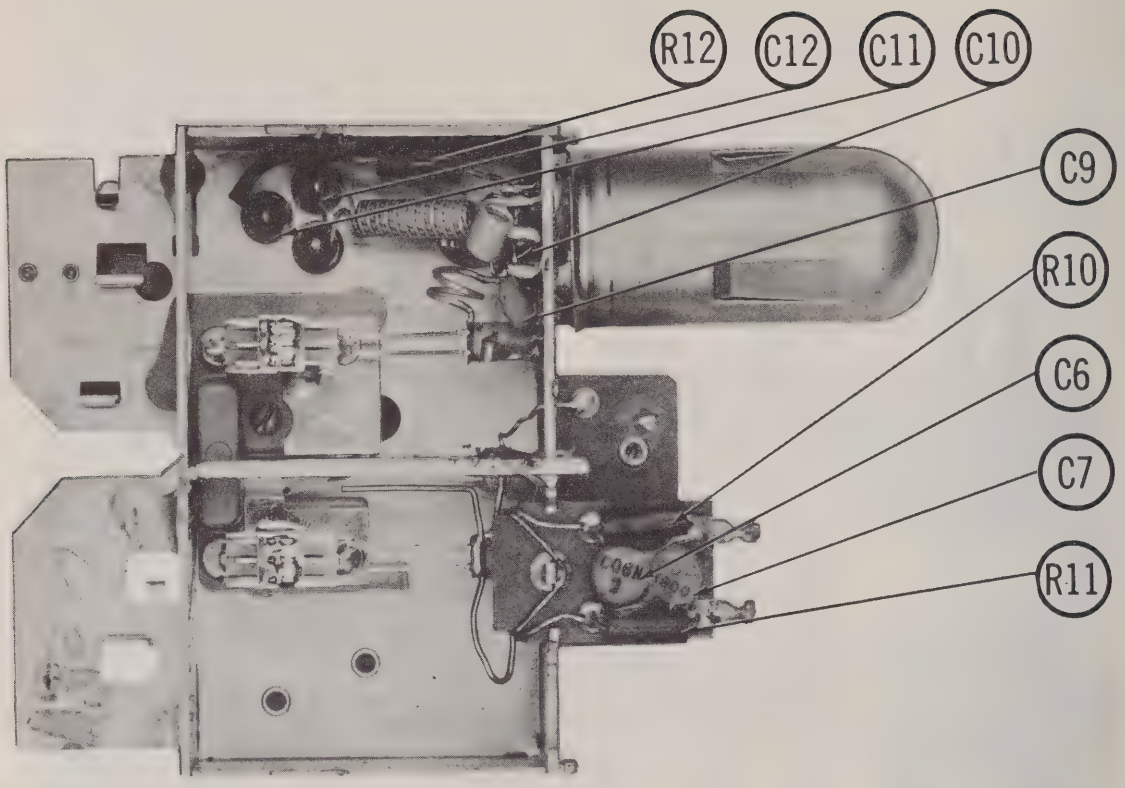


TUBE PLACEMENT CHART

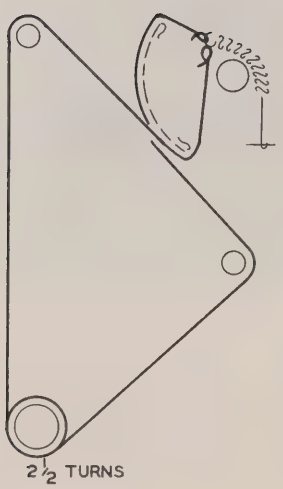
PROPERTY OF
L. F. E[illegible]MSHIP
[illegible] AVENUE
DENVER, COLORADO

HOFFMAN MODELS B3191, U, M3181, U,
SP3181, U (Ch. 420, U)
CHASSIS TOP VIEW

FOLDER 2



TUNER REAR VIEW



FINE TUNING DRIVE CORD STRINGING

PROPERTY OF
L. F. D. APPRENTICE
3070 LEADE ST.
DENVER, COLORADO

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

ALTERNATE TUNER SCHEMATIC

HOFFMAN MODELS 83191, U, M3181, U, SP3181, U (Ch. 420, U)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	UHF Oscillator	6AF4	
V2	HF Amplifier	6BQ7A	
V3	Mixer-Oscillator	6AT6	
V4	1st Video IF Amp	6BZ6	
V5	2nd Video IF Amp	6BZ6	
V6	3rd Video IF Amp - Video Detector	6AS6	
V7	Video Output-AGC Keying	6AW8	
V8	Sound IF Amp	6AU8	
V9	Ratio Det.	6AL5	
V10	AF Amp -Phase Inverter	12AX7	
V11	Audio Output	6V6GT	
V12	Audio Output	6V6GT	
V13	Sync Separator	6BY6	
V14	Sync Phase Inverter	6C4	
V15	Vert. Mult	6CG7	
V16	Vert. Output	6W6GT	
V17	Horiz. AFC	6AL5	
V18	Horiz. Mult	6CG7	
V19	H-AFC Rectifier	6CG6G	
V20	Damper	5AU4GT	
V21	HV Rectifier	1B3GT	
V22	LV Rectifier	5AU4	

PICTURE TUBE

ITEM No	REPLACEMENT DATA			NOTES
	HOFFMAN PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	
V23	21AC94A 21AMP4A	21AC94A 21AMP4A ①	21AC94A/ 21AMP4A ②	① Aluminized ② Silver screen "85"
		21ACP4/21AMP4	21AMP4A ② 21ACP4	
	21ALP4A	21ALP4A ① 21ALP4B/21ALP4A ①	21ALP4A/ 21ALP4B ②	
			21ALP4	

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA							
	CAP	VOLT	HOFFMAN PART No	AEROVOX PART No	CORNELL DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No	NOTES
C1A	400	350	4256A	AFB4-18-75		FP375-5		Q-231-5	5GA-D47	R3619 *
B	40	350				FTC36				
C	40	300								
C2A	400	150	4255A	AFB4-08-55		FP356		C-116	5GA-D47	R3403 *
B	450	50				TC39		MT-0550		
C	20	350								
C3	50	50	4254A	BBR5-50	TC30	TD-5-50	MT-1504	TVA-1303		
C4	20	50	4253A	BBR30-150	TC48	TD-30-150	MT-1530	TVA-1410		
C5	5	50	4277	BBR5-50	TC30	TD-5-50	MT-1504	TVA-1303		

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd for Mica and Ceramic Capacitors

ITEM No	RATING		REPLACEMENT DATA								
	CAP	VOLT	HOFFMAN PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No	NOTES
C8	8			HI 5	DD-050	L10V5	ED-5	UC-555	5GA-V5	
C9	5			HI 5	DD-050	L10V5	ED-5	UC-555	5GA-V5	
C9	15			HPG-SI 16	TCS-15	CD05E5	TCD-15		5TCC-Q15	5% N330
C9	3.6									
C10	200									
C11	1000			EF-001	MFT-1000				5GSC-D1	
C13	1000			EF-001	MFT-1000				5GSC-D1	
C13	130			BPD-0013	DD-131	L10Q2	ED-130	UC-5312	5GA-T12	
C14	8			SI 8	DD-050	L10V5	ED-5	UC-555	5GA-V5	
C15	6.8			NPO-SI 6.8	TCC-6S8	C10V6S	TCO-6.8	5TCC-Q6	5TCC-5S6	NPO
C16	6.8			NPO-SI 6.8	TCC-6S8	C10V6S	TCO-6.8		2T-5S68	NPO
C17	1500			BPD-0015	DD-152	L10Q5	ED-1500	BY A10D5	ED-0015	DC5215	5HK-D15	
C18	1000			EF-001	MFT-1000						5GSC-D1	
C19	2.2			NPO-SI 2.2	TCC-2S2	C10V2SC	TCO-2.2		5TCC-Q2	NPO
C20	3-12								5TCC-Q3	
C21	1500			BPD-0015	DD-152	BY A10D5	ED-0015		DC5215	5HK-D15	
C22	1000			EF-001	MFT-1000						5GSC-D1	
C23	5-3				529-3		315-D		CT36EA		
C24	1000			EF-001	MFT-1000						5GSC-D1	
C25	5-3				529-3		315-D		CT36EA		
C26	5				TCZ-5S				TCC-5		
C27	1800			BPD-0018	DD-182	BY A10D5	ED-0018		DC5218	5HK-D18	
C28	B										N800
C29	10										N1400
C30	68			M750-SI 68	TCH-68	C10Q6SU	TCT-68		5TCC-Q68		N750
C31	470			BPD-0047	DD-471	BY A10T4	ED-470	UC-5347	5GA-T47		
C33	1000			EF-001	MFT-1000				5GSC-D1		
C34	1000			EF-001	MFT-1000				5GSC-D1		
C35	1500			BPD-0015	DD-152	BY A10D5	ED-0015		DC5215	5HK-D15	
C36	470		14009	1464-00047	SRS747	ED-470		MS-347		10%	5TM-P47
C37	470		14008	1464-00047	DS-471	SRS747	ED-470		MS-347	10%	
C38	1000		14045	BPD-001	DD-102	BY A82A	ED-1000		DC52E	5HK-D1	
C39	47			NPO-SI 47	TCC-47	C10V4S	TCO-47		5TCC-Q47		NPO
C40	470		14009	1464-00047	DS-471	SRS747	ED-470		MS-347	10%	
C41	470		14008	1464-00047	DS-471	SRS747	ED-470		MS-347	10%	
C43	470		14009	1464-00047	DS-471	SRS747	ED-470		MS-347	10%	
C43	1000		14045	BPD-001	DD-102	BY A82A	ED-1000		DC52E	5HK-D1	
C44	33			NPO-SI 33	TCC-33	C10V3SC	TCO-33		2T-5S33		NPO
C45	470		14009	1464-00047	DS-471	SRS747	ED-470		MS-347	10%	
C46	470		14008	1464-00047	DS-471	SRS747	ED-470		MS-347	10%	
C47	1000		14045	BPD-001	DD-102	BY A82A	ED-1000		DC52E	5HK-D1	
C48	1000		14045	BPD-001	DD-102	BY A82A	ED-1000		DC52E	5HK-D1	
C49	10		14058	1469-00001	DD-100	L10Q2	ED-10		2T-541	MS-41	10%
C50	47		4007	1469-00047	DD-47	L10Q47	ED-47			MS-447	10%
C51	4700		4035	BPD-0047	DD-472	BY A10D4T	ED-0047		UC-5347	5GA-D47	
C52	4700		4035	BPD-0047	DD-472	BY A10D4T	ED-0047		UC-5347	5GA-D47	
C53	33	200	6131	P388N-33		CUB3P33			2T-P33	20%	5TM-P33
C54	4700		4035	BPD-0047	DD-472	BY A10D4T	ED-0047		UC-5347	5GA-D47	
C55	.047	200		P388M-4		CUB2P4			2TM-P4	20%	5TM-P4
C56	130	3000	14046		DD50-131	HY30Z12			30GA-T13		
C57	4700		4035	BPD-0047	DD-472	BY A10D4T	ED-0047		UC-5347	5GA-D47	
C58	.47	200	4172	P388N-47		CUB2P47			2TM-P47		5TM-P47
C59	33		4094	1469-00033	DD-330	L10Q33	ED-33		2T-5433	MS-433	10%
C60	68		4046	1469-00068	DD-680	L10Q68	ED-68			MS-468	10%
C61	.1	400	4150	P458N-1		DF-104	CUB4P1		GEM-4147	4TM-P1	
C62	.047	200	4147	BPD-09		DF-503	CUB2E47		GEM-5147	2TM-E47	
C63	.1	600	6126	P568N-1		DF-104	CUB6P1		GEM-601	6TM-P1	
C64	2.2		4097	NPO-SI 2.2		TCZ-2S2	C7AV2ZC	TCO-2.2	5TCC-Q2	NPO	
C65	47		4097	1469-00047		LD047	ED-47			10%	
C66	4700		4035	BPD-0047		DD-472	BY A10D4T	ED-0047	UC-5347	5GA-D47	
C67	4700		4035	BPD-0047		DD-472	BY A10D4T	ED-0047	UC-5347	5GA-D47	

CAPACITORS (cont)

ITEM No	RATING		REPLACEMENT DATA							
	CAP	VOLT	HOFFMAN PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No	NOTES
C68	4700		4035	BPD-0047	DD-472	BY A10D4T	ED-0047	UC-5247	5GA-D47	
C69	.0033	200	14059	BPD-0033	DD-332	CUB4D33	GP-3300	GEM-5233	5TM-D33	
C70	4700		4035	BPD-0047	DD-472	BY A10D4T	ED-0047	UC-5347	5GA-D47	
C71	220		4094	1469-00022	DE-322	L10T33	ED-33 0		MS-333	10%
C72	4700		4035	BPD-0047	DD-472	BY A10D4T	ED-0047	UC-5347	5GA-D47	
C73	.047	200	4147	BPD-05	DF-503	CUB3E47		GEM-4147	3TM-E47	
C74	4700		4035	BPD-0047	DD-472	BY A10D4T	ED-0047	UC-5347	5GA-D47	
C75	.0047	400	4127	BPD-0047	DD-472	BY A10D4T	ED-0047	UC-5347	5GA-D47	
C76	4700		4035	BPD-0047	DD-472	BY A10D4T	ED-0047	UC-5347	5GA-D47	
C77	4700		4035	BPD-0047	DD-472	BY A10D4T	ED-0047	UC-5347	5GA-D47	
C78	001									
C79	.033	400	4152	P468N-033		CUB4S33		GEM-4153	5TM-S33	
C80	.047	400	4148	BPD-05	DF-503	CUB4E47		GEM-4147	4TM-E47	
C81	.047	400	4148	BPD-05	DF-503	CUB4E47		GEM-4147	4TM-E47	
C82	1000		14045	BPD-001	DD-102	BY A82E	ED-1000	DC52E	5HK-D1	
C83	4700		4035	BPD-0047	DD-472	BY A10D4T	ED-0047	UC-5347	5GA-D47	
C84	.0022	400	4180	BPD-0022	DE-222	CUB4D22	GP-2200	GEM-6223	5TM-D22	
C85	220		4094	1469-00022	DE-322	L10T33	ED-330		MS-333	10%
C86	10000		4097	BPD-01	DD-103	BY A8E1	ED-01	DC5U	5HK-S1	
C87	47		4007	1469-000047	DD-470	L10Q47	ED-47		MS-447	10%
C88	1	300	6143	P388N-1	DF-104	CUB3P1		GEM-301	3TM-P1	
C89	4700		4035	BPD-0047	DD-472	BY A10D4T	ED-0047	UC-5347	5GA-D47	
C90	0039	400	4184	1464-0039					MS-339	10%
C91	047	300	4147	BPD-05	DF-503	CUB2E47		GEM-4147	2TM-E47	
C92	1	600	6126	P568N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C93	.1	300	4243	P388M-1	DF-104	CUB3P1		GEM-501	3TM-P1	
C94	1	600	6250	P468M-1	DF-104	CUB4P1		GEM-601	4TM-P1	
C95	.001	300	4178	1464-001		1R5X	ED-1000	MCB2E1	MS-2E1	10%
C96	.001	300	4178	1464-001		1R5X	ED-1000	MCB2E1	MS-2E1	10%
C97	.0033	400	6188	1464-0033		1R5D83			MS-333	10%
C98	.0047	300	6186	1464-0047		1R5D47			MS-347	10%
C99	.047	400		BPD-05	DF-503	1R5D47		GEM-4147	4TM-E47	
C100	68		4046	1469-000068	DS-680	L10Q68	ED-68		MS-339	10%
C101	3300		4037	1464-0033		1R5D33			MS-339	10%
C102	470		14008	1464-00047	DS-471	SRS747	ED-470		MS-347	10%
C103	.001	400	4178	1464-001		1R5X	ED-1000	MCB2E1	MS-2E1	10%
C104	68		4046	1469-00039	DS-391	SRS739	CY15C39BJ		MS-339	10%
C105	4700		4035	BPD-0047	DD-472	BY A10D4T	ED-0047	UC-5347	5GA-D47	
C106	.1	400	4150	P468N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C107	.047	600	6133	BPD-05	DF-503	CUB6E47		GEM-6147	6TM-E47	
C108	47	3000	14048							
C109	140	3000								

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					
	RESISTANCE	WATTS	HOFFMAN PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No	MALLORY PART No	INSTALLATION NOTES
R1A	2Meg	½	4067A	ABT-47S		G3-13SEXX	UDT-396	Volume with taps ⑥ 800E and 1Meg
B	Shaft			AE-3		Not Reg.	Not Reg.	
	Switch			KB-3		76-3	UB-27	
R3A	1Meg	½	4185A					Treble
B	Switch	½						TV-Phono
R3A	2Meg	½	4060A	FI-67		UH737		Bass
B	150K	½		RB-33	*	Not Reg.		Brightness
R4A	1.25Meg	1	4081A			UH733		Vert. Hold
B	60K	1				Not Reg.		Contrast with taps ⑥ 30K and 35K Height
R5A	2Meg	1	4065	BX-75	A47-22Meg-S	QH-139	TA35L	
B	Shaft			Not Reg.	FXB-1/4	Not Reg.	Not Reg.	Vert. Linearity - wire wound
R6	300KΩ	½	4034A	WW-303	3B-300Ω	QH-137	FL-2.5K	Sync Noise Clipper Adjustment
R7A	4Meg	½	4093A	AB-56	A47-44Meg-S			
B	Shaft			AE-1	FXB-1/4			Area Control (AGC)
R8A	50K	½	4064	BX-31	A47-50K-S	QH-123	TA54L	
B	Shaft			Not Reg.	FXB-1/4	Not Reg.	Not Reg.	Horiz. Drive
R9A	2Meg	½	4066	BX-61	A47-80E-S	QH-133	TA56L	
B	Shaft			Not Reg.	FXB-1/4	Not Reg.	Not Reg.	

* Concentrist Equivalent K-2 RH, Base Elements & Shafts HU-159, PI-304 (Panel) HU-238, RI-316 (Rear)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA			NOTES
	OHMS	WATT	HOFFMAN PART No.	IRC PART No.		
R10	680K			BTS-680K		
R11	680K			BTS-680K		
R12	10K			BTS-10K		
R13	680K			BTS-680K		
R14	10K			BTS-10K		
R15	100K			BTS-100K		
R16	820K			BTS-820K		
R17	560K			BTS-560K		
R18	6800Ω			BTS-6800		
R19	220K			BTS-220K		
R20	100K			BTS-100K		
R21	3300Ω			BTS-3300		
R22	10K			BTS-10K		
R23	3300Ω	1		BTA-3300		
R24	100K			BTS-100K		
R25	680Ω			BTS-680		
R26	1800Ω	1	2451B	BTA-1800		
R27	470Ω		4054	BTS-470		
R28	100K		4171			
R29	2.7Meg		14030			
R30	470K		4022			
R31	470K		4022			
R32	3300Ω		4007	BTS-18K		
R33	18K		4019			
R34	470Ω		4054	BTS-100K		
R35	470Ω		4054			
R36	47K		4058			
R37	470Ω		4054	BTS-470		
R38	470Ω		4659	BTS-47		
R39	470Ω		4054	BTS-470		
R40	22K		4030			
R41	470Ω		4054	BTS-470		
R42	47Ω		4659	BTS-47		
R43	47K		4058	BTS-47K		
R44	470Ω		4054	BTS-470		

ITEM No.	RATING		REPLACEMENT DATA			NOTES
	OHMS	WATT	HOFFMAN PART No.	IRC PART No.		
R45	150Ω		4659	BTS-150		
R46	15K		4619	BTS-15K		
R47	4700Ω		4570	BTS-4700		
R48	12K		4046	BTS-12K		
R49	10K		4597	BTS-10K		
R50	18K	3	4651	BTS-18K		
R51	3300Ω	4	44624			
R52	1200Ω	1	24503	BTA-1200		
R53	2200Ω		4650	BTS-2200		
R54	270K		4603	BTS-270K		
R55	47K		4659	BTS-47K		
R56	4.7Meg		4644	BTS-4.7Meg		
R57	22K		4649	BTS-22K		
R58	10K		4597	BTS-10K		
R59	8800Ω		4587	BTS-8800		
R60	150Ω		4616	BTS-150		
R61	180Ω		14516	BTS-180		
R62	10K		4597	BTS-10K		
R63	10K		4597	BTS-10K		
R64	39K		24534	BTS-39K		
R65	880K		24568	BTS-880K		
R66	47K		4659	BTS-47K		
R67	100K		4671	BTS-100K		
R68	10Meg		4604	BTS-10Meg		
R69	10Meg		4604	BTS-10Meg		
R70	470K		4623	BTS-470K		
R71	47K		4623	BTS-470K		
R72	270K		4603	BTS-270K		
R73	270K		4603	BTS-270K		
R74	100K		4671	BTS-100K		
R75	270Ω	2	14639	BTS-270		
R76	100K		24610	BTS-12K		
R77	2.2Meg		4606	BTS-2.2Meg		
R78	470K		4623	BTS-470K		
R79	150K		4589	BTS-150K		

RESISTORS (cont)

ITEM No.	RATING		REPLACEMENT DATA			NOTES
	OHMS	WATT	HOFFMAN PART No.	IRC PART No.		
R101	100K		4571			
R102	4.7Meg		4544			
R103	470K		4623			
R104	100K		4571			
R105	82K		24570			
R106	820Ω		4640	BTS-1800		
R107	1800Ω 5%		24517	BTS-1800 5%		
R108	470K		4623	BTS-470		
R109	470K		4623	BTS-22K		
R110	100Ω		4644	BTS-4.7Meg		
R111	1000Ω	3	14695	BTS-1000		
R112	180K	2	24509	BTS-180K		
R113	12K	2	24592	BTS-12K		
R113	1200Ω	4	4718A			
R114	470Ω					
R115	3.75 5%		4769			BW1-3.7 5%
R116	3900Ω			BTS-100		
R117	120Ω		4716A			
R118	1Meg		4664	BTS-1Meg		
R119	2.2Meg		4606	BTS-2.2Meg		
R120	330K		4677	BTS-330K		

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	HOFFMAN PART No	Halderson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	117VAC	600VCT	6V	807L					
	2.4A	300A	3A						

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							
		HOFFMAN PART No	Halderson PART No	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T2	Vert. Output	5155A-3	21200①	A-8123 ③		V50T	A-8123①	26B7T	A-10BX ⑤
T3A	Alt. Vert. Output	5155A							
B	Yoke-Horiz. (12MH) (90°) Vert. (29MH)	9681J-①	DP606	MDP-31	2S7DA	T90F12/47	DY-12A	Y-16	T-40 & WW6
	Alternate Yoke	9981J							
T4	Horiz. Output	9979S 5177A-4	FB-613 ③	HVO-36	2S87L & 2S40 ②	K094 ③	HO-356 & WC-10 ②	FLY-16 & WC-20 ②	D-50 & WC-10 ②
	Alt. Horiz Output	5177A							
T5	Width Coil (3.7-17MH)	5464	RF800 ①	MWC-11	21BH	20UR16	WC-5 ①	WC-18 ①	WLC-5

① Use 8 to 1 horiz ratio.
② Drill new mounting hole(s).
③ Includes resistors R97, R98, R114, capacitor (C109) and yoke plug.
④ Connect horizontal network across yoke terminals #3 and #7.
⑤ Use original horizontal network if necessary.
⑥ Enlarge mounting hole.
⑦ Use terminals #1 and #3.
⑧ Use red and blue terminals.
* This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halderson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	8	8	9	9	9	9	9	9
	7	7	7	7	7	7	7	7
	6	5	5	5	5	5	5	5
	5	4	4	4	T	4	T	4
	4	3	3	3	3	3	3	3
	3	1	1		1			
	2	6	6	214R1 Term. #6	2	WC-10 Inner Winding	WC-20 Term. #1	Blue Term WC-10
	1	2	2	214R1 Term. #7	6	WC-10 Inner Winding	WC-20 Term. #2	Red Term WC-10
Cement Width Coil Resis	3 & 4	1 & 3	1 & 3	214R1 Terms. "A" & B" across 1 & 3	1 & 3	WC-10 outer winding across 1 & 3	WC-20 Terms #3 & #4 across 1 & 3	Orange & Black Terms. across 1 & 3
Special Note:	⑧ If picture is out of phase, reverse width coil primary or secondary.							

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE		HOFFMAN PART No	REPLACEMENT DATA				NOTES
	PRI	SEC 1		Halderson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
T6	7000Ω	1.8Ω SEC. 2 2-4Ω	5182A					

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA					NOTES
	SIZE	FIELD	V. C. IMP.	HOFFMAN PART No.	QUAM PART No.		
SP1	4"	PM	3-4Ω	9U7	4AO7		‖ Parallel and phase
SP2	8"	PM	3-4Ω	9U39 ①	8AS1 ①		
SP3	8"	PM	3-4Ω	9U39 ①	8AS1 ①		

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		HOFFMAN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	1st. Video IF	5219A	17-4534	TV-131	6226	
L2	2nd. Video IF	5334A	17-4535		6221	Includes 41.25MC Trap
L3	3rd. Video IF	5327A	17-4536		6222	Includes 47.25MC Trap
L4	4th. Video IF	5254A	17-5004	TV-126	6234	
L5	Series Peaking Coil	5263A	19-3100	TV-181	6177	100 Microhenries
L6	Shunt Peaking Coil	5307A			6156	820 Microhenries
L7	4.5MC Trap	5321A	20-1004	TV-151	1469	
L8	Series Peaking Coil	5250A	19-3300		6132	330 Microhenries
L9	Sound IF	5321A	20-1004	TV-151	1469	
L10	Ratio Det.	5252A	6205	TV-115	6205	
L11	RF Choke	5266	19-1002	BC-563	4606	2.6 Microhenries
L12	RF Choke	5266	19-1002	BC-563	4606	2.6 Microhenries

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	HOFFMAN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L13	53Ω		5447	19-1576	TV-163	6210		H-102	HS-5	20.5 -45 Millihenries

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	HOFFMAN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L14	.300A	25Ω	1.4 Hy.	5164A	C5037	C-2996	C-2326 ①	26C44 ①	C-17X

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	HOFFMAN PART No.	REPLACEMENT DATA	
K1	Vertical Integrator	2200MMF, 4700MMF, 4700MMF, 22K, 8200Ω, 8200Ω	9695	Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-110 PC-100 115TM1 1405-01 V-1

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT (Measured)	HOFFMAN PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	
M1		10017 ①	1215 ①		1T1 ①			AGC Clamper

① Selenium diode.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		HOFFMAN PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N82A		1N82A	1N82A	UHF Mixer (Clip-in)

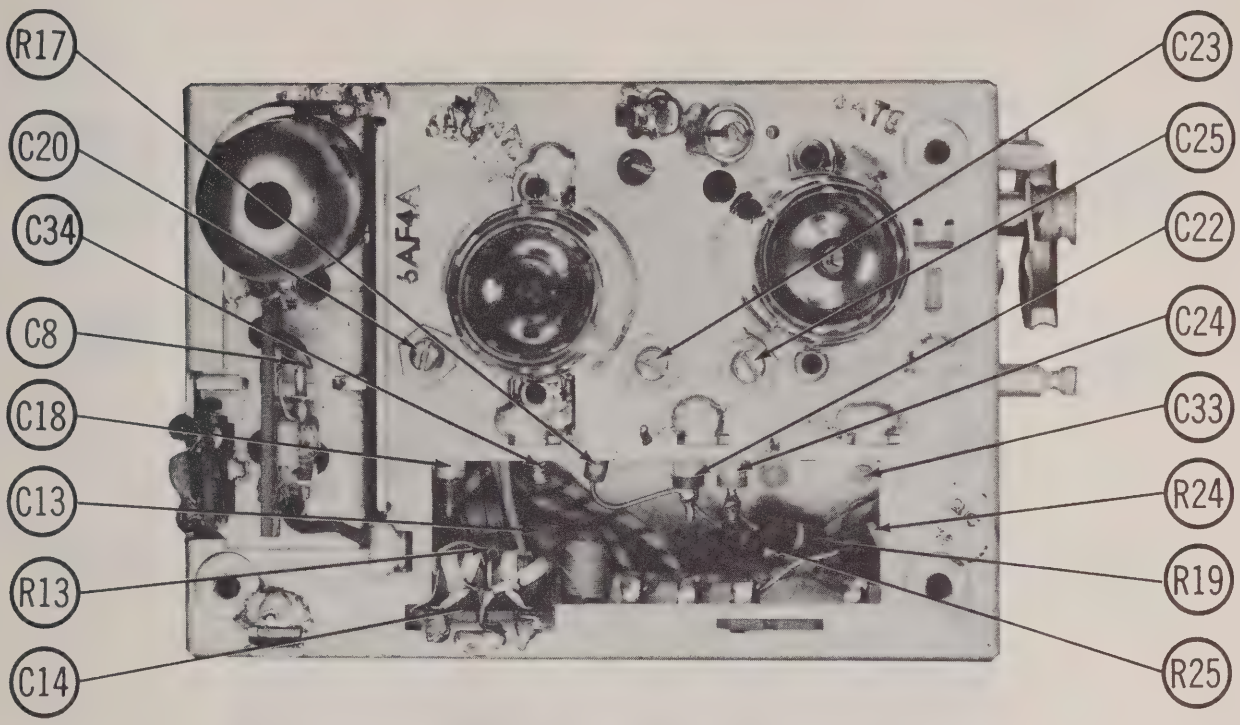
MISCELLANEOUS

ITEM No.	PART NAME	HOFFMAN PART No.	NOTES
M3	Pilot Light	9503	Type #51
M4	Tuner	9931	UHF-VHF
	Tuner	9930	VHF
M5	Focus Magnet	9882	
M6	Ion Trap	9713	

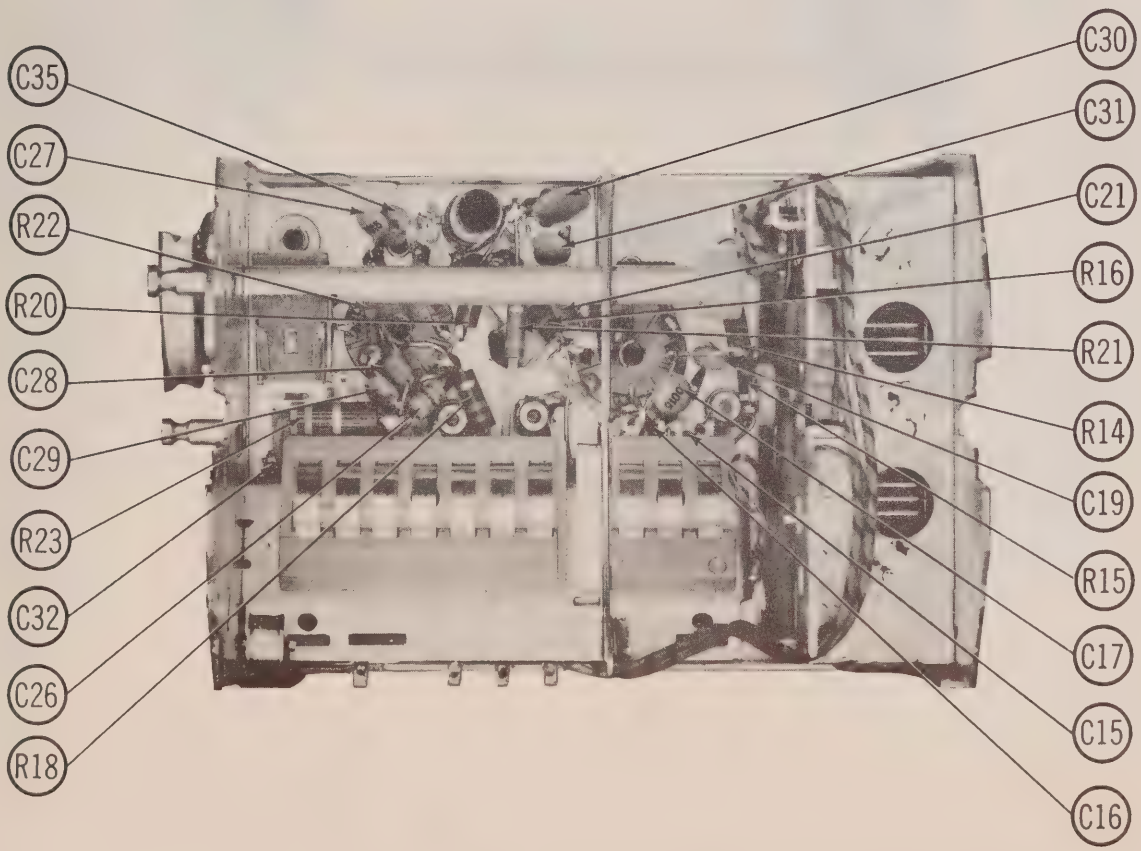
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

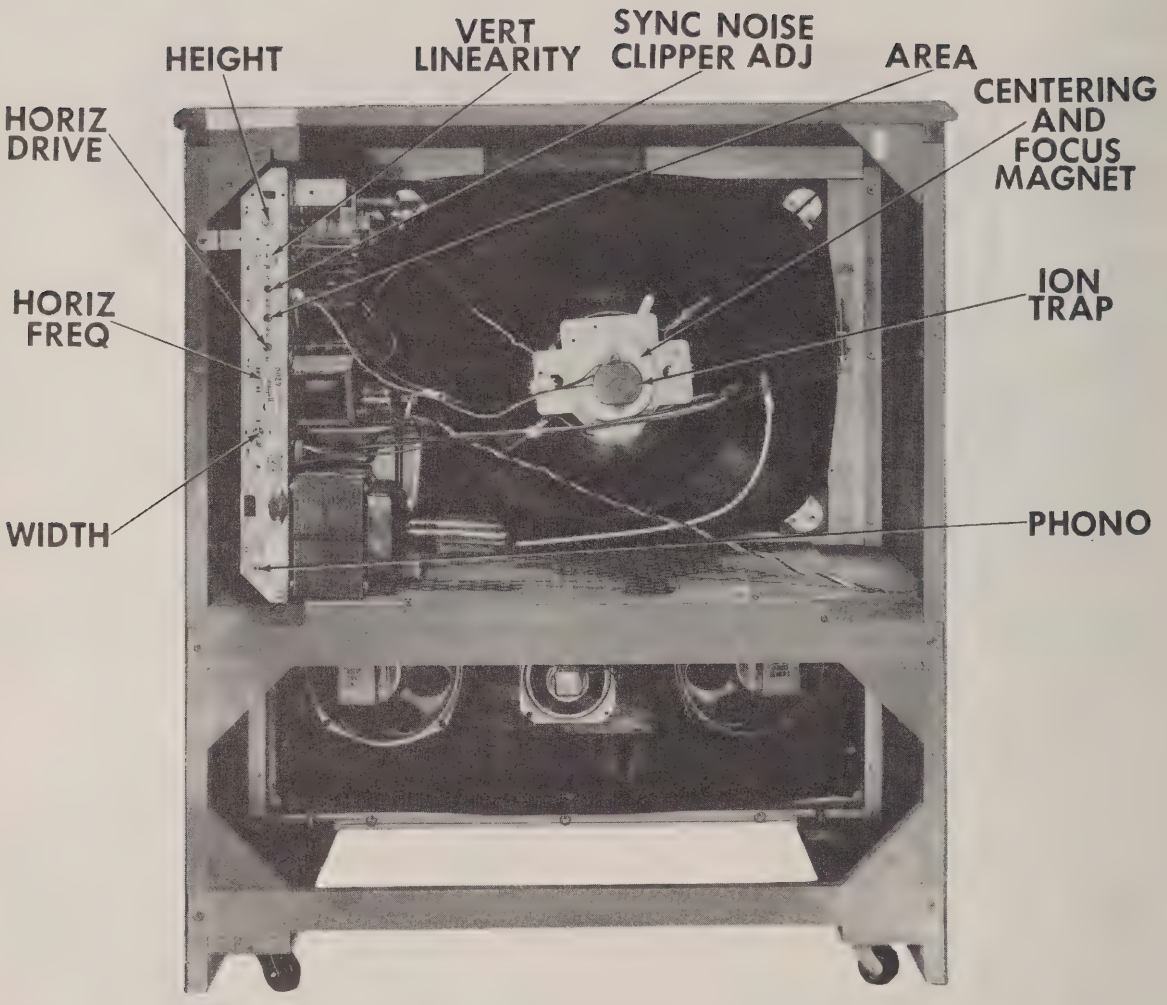
NAME	PART NO.	DESCRIPTION
Safety Glass	830	
Mask	22078	
Knob	B33765	UHF Channel Selector
Knob	B33766	VHF Channel Selector - UHF versions
Knob	B33841	VHF Channel Selector - VHF versions
Knob	B33855	Fine Tuning - UHF versions
Knob	B33840	On-off-volume, treble
Knob	B33056	Vert. Hold, bass
Knob	B33839	Brightness, contrast
Knob	33040	Pushbutton (Specify channel number)
Cabinet	77516	Mahogany - Model M3181
Cabinet	77518	Maple - Model SP3181
Cabinet	77517	Mahogany - Model M3181U
Cabinet	77519	Maple - Model SP3181U
Cabinet	77526	Oak - Model B3181
Cabinet	77527	Oak - Model B3181U



TUNER-TOP VIEW



TUNER-BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the brightness and contrast controls for a normal picture.

Turn the horizontal hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the horizontal hold slowly counter clockwise until the picture just falls into sync.

Turn to an unused channel. If vertical lines appear near the center of the screen, slowly adjust the horizontal drive control (R9) until white lines disappear.

If in step 5 the horizontal drive was adjusted, tune in a TV station and repeat steps 3 and 4. Check horizontal sync by switching off channel and back again.

Adjust width slug (B1) for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally.

PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

PHILCO MODELS E-3032I, R, E-3034, B, SA, SS, UE-3032I, R, UE-3034B, SA, SS (Ch. 7H20, U, 7H22)

PROPERTY OF
L. F. BLANKENSHIP
[illegible]
DENVER, COLORADO

MODEL E3034 (Ch. 7H20)

PHILCO MODELS E-3032I, R, E-3034, B, SA, SS, UE-3032I, R, UE-3034B, SA, SS (Ch. 7H20, U, 7H22)

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FOLDER 3

PHILCO MODELS E-3032I, R, E-3034, B, SA, SS, UE-3032I, R, UE-3034B, SA, SS (Ch. 7H20, U, 7H22)

DENVER, COLORADO

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type control knobs from the top, 2 from the side.
2. Remove 3 metal screws from the bottom of the rear cover, 2 metal screws holding AC line cord and remove the rear cover.
3. Remove 2 speaker leads.
4. Remove 2 metal screws and the antenna terminal board.
5. Remove 4 metal screws and the cabinet front.
6. Remove 6 metal screws holding the picture tube bracket.
7. Remove 2 metal screws and the handle.
8. Remove 4 chassis bolts from the bottom.
9. Remove the chassis from the front of the cabinet.
10. Remove 2 speaker nuts and the speaker.

MODEL E3034 (Ch. 7H20)

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS

TRADE NAME	Philco	MODELS	CHASSIS
		E3032I, E3032R, E3034, E3034B, E3034SA, E3034SS ...	7H20
		UE3032I, UE3032R, UE3034, UE3034B, UE3034SA, UE3034SS	7H20U 7H22
MANUFACTURER	Philco Corp., Tioga & "C" Streets, Philadelphia, Pa.		
TYPE SET	Television Receiver		
TUBES	Fifteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 150 Watts, 1.3 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 metal screws holding the front of the cabinet. Remove the front and safety glass.

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 2, or 6 and 10. Readjust the ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The horizontal frequency coil is used as the horizontal hold. Set the horizontal oscillator auxiliary control to the center of its range. Adjust the horizontal hold until the picture synchronizes. (For location, see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the discriminator secondary (A8) located on top of chassis.

FUSES

A 5.6Ω fusible resistor (R68) is used for LV power supply protection. (For location , see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

PHILCO MODELS E-3032I, R, E-3034, B, SA, SS, UE-3032I, R, UE-3034B, SA, SS (Ch. 7H20, U, 7H22)

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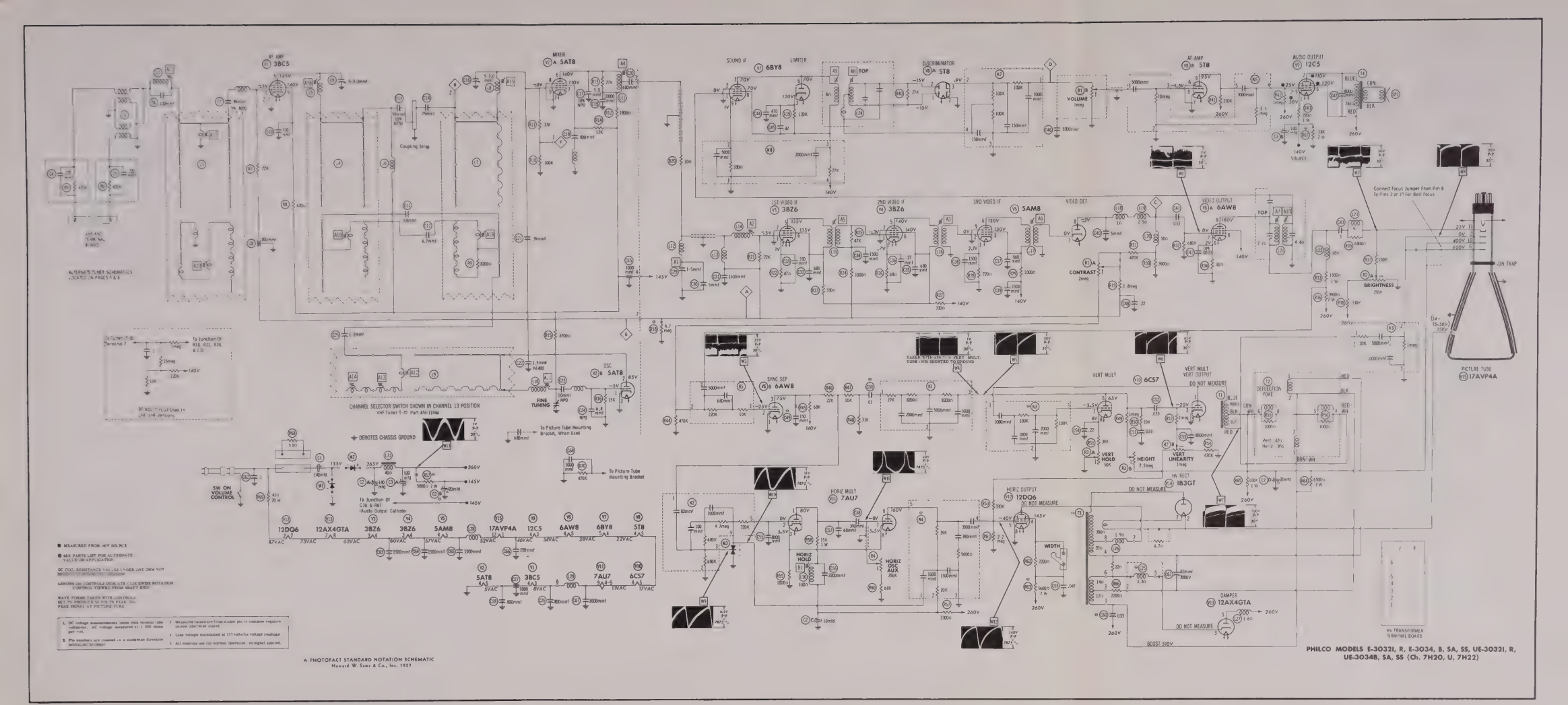
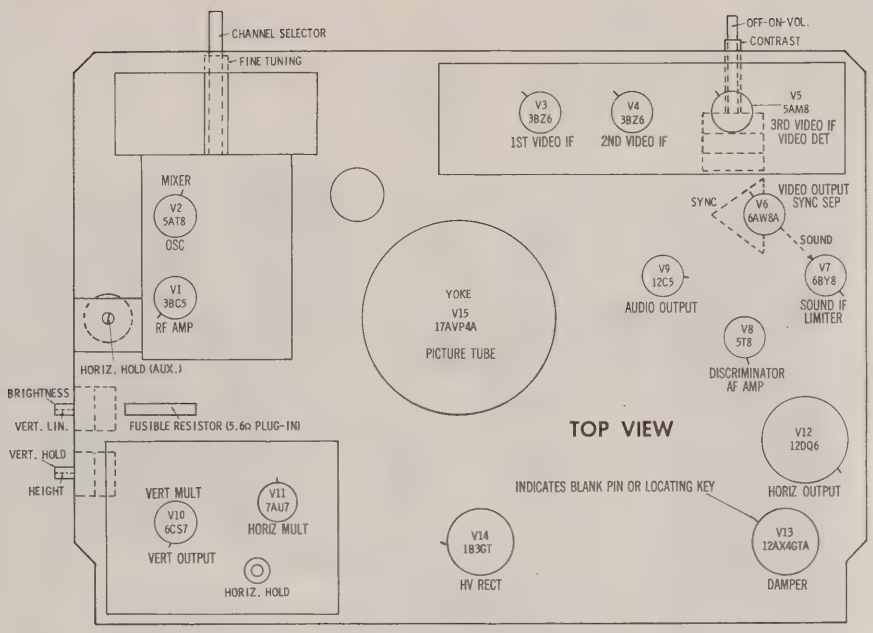


A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

PHILCO MODELS E-3032I, R, E-3034, B, 5A, 5S, UE-3032I, R, UE-30348, 5A, 5S (Ch. 7H20, U, 7H22)

TUBE PLACEMENT CHART



DENVER, COLORADO

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

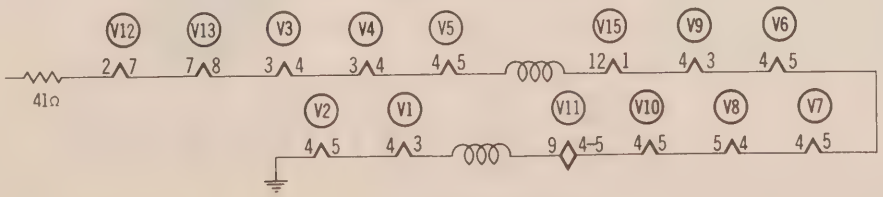
POWER SUPPLY FAILURE
No raster, no sound - **Fusible Resistor (R68), Rectifier (M1, M2)**

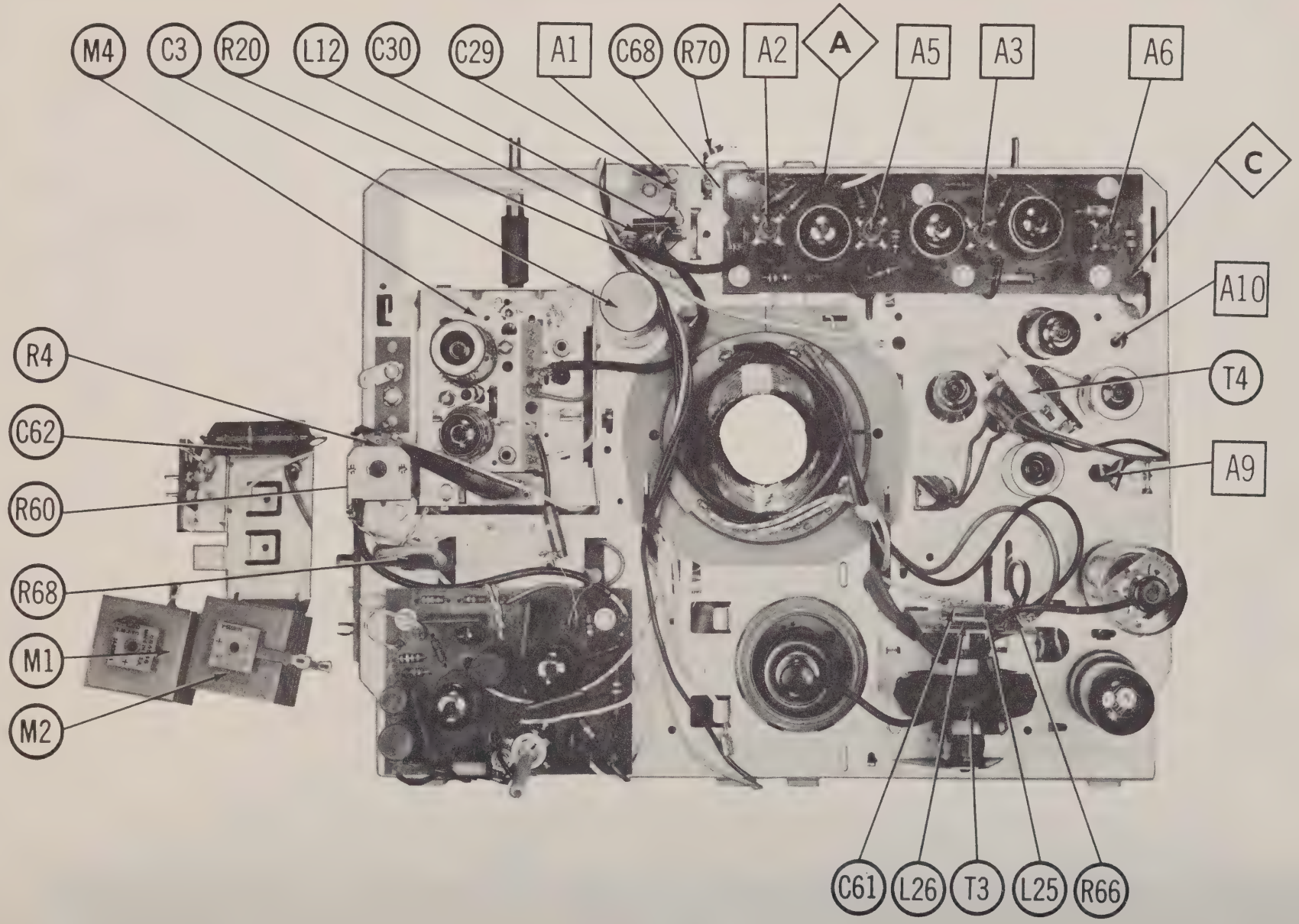
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6, V9**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V15, V9**
Has pic, no sound - **V7, V8, V9**

SYNC FAILURE
No vert. sync - **V6, V9**
No horiz. sync - **V6, Diode (M3), V9**
No vert. or horiz. sync - **V6, V9**

SWEEP FAILURE
No raster, has sound - **M3, V11, V12, V13, V14, V15**
No vertical deflection - **V10**
Poor vert. linearity or foldover - **V10**
Poor horiz. linearity or foldover - **V11, V12, V13**
Narrow picture - **V11, V12, V13, M1, M2**
Vert. off freq. - **V10**
Horiz. off freq. - **V11**

This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below).





CHASSIS TOP VIEW

PROPERTY OF
L. F. BLANKENSHIP
3224 KITTREDGE ST.
DENVER, COLORADO

PHILCO MODELS E-3032I, R, E-3034, B, SA, SS, UE-3032I, R, UE-3034B, SA, SS (Ch. 7H20, U, 7H22)

ALTERNATE TUNER SCHEMATIC

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
Do not remove the horizontal oscillator tube (V11) to disable the high voltage.

VIDEO IF ALIGNMENT

Set contrast control to maximum.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Calibrate scope for two volts peak to peak.
Connect the negative lead of a 2.5 volt bias supply to point (A). Positive to chassis.
Adjust generator gain to provide 2 volts peak to peak on the scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to point (B). Low side to chassis.	Not used	47.25MC	4	Vert. Amp. thru 10K to point (C). Low side to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	"	42.0MC	"	"	A2	Adjust for maximum deflection.
3.	"	"	"	43.5MC	"	"	A3	"
4.	"	"	"	45.0MC	"	"	A4	"
5.	"	"	"	45.75MC	"	"	A5	"
6.	"	"	"	44.4MC	"	"	A6	"
7.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	69MC (10MC Swp)	67.25MC to antenna terminals 45.75MC to point (B)	"	"		Adjust fine tuning until the two markers coincide. Do not disturb the fine tuning during remainder of alignment.
8.	"	"	"	67.25MC 70.0MC	"	"		Adjust A4 to position 67.25MC marker at 50% on curve. (See Fig. 1). Adjust A3 to position 70.0MC marker at 50% on high frequency side. Adjust A6 to level curve if it is tilted.

4.5MC TRAP ALIGNMENT

1. Connect a 4.5MC detector (Fig. 2) to pin 11 (cathode) of the picture tube. Preliminary padding of the detector: Connect the detector to an accurate source of 4.5MC signal and adjust the slug of the transformer for maximum deflection.
2. Connect the DC probe of the VTVM to the output of the detector.
3. Turn the set on and tune in a TV station and adjust the fine tuning SLIGHTLY clockwise from the point of best picture.
4. Adjust A7 for MINIMUM deflection on the VTVM.

SOUND IF ALIGNMENT

Connect the DC probe of the VTVM to point (D) and common to chassis.
Turn the set on and tune in a TV station. Detune A8 to give a positive peak voltage. Detune the fine tuning counter clockwise or reduce the signal input to the receiver, so as not to exceed .75 volt during alignment. In some areas it may be necessary to apply bias voltage to point (A) to maintain meter reading below .75 volt. Adjust A9 and A10 for maximum deflection. Adjust fine tuning for best picture and readjust A8 for zero voltage.

VHF OSCILLATOR ALIGNMENT FOR TUNERS #T70 AND T81

Set the fine tuning to the center of its range. Set the channel selector to the highest high band channel operating in the area. Adjust A11 for best picture and sound. Check all other high band channels operating in the area in a descending order and if necessary, adjust the coil for that channel by bending toward or away from the wafer for best picture and sound.
Set the channel selector to the highest low band channel operating in the area and adjust the appropriate slug for best picture and sound. A12 is the adjustment for both channels 6 and 5. However, the slug can only be reached when the selector is set to channel 6. Therefore, to adjust channel 5 switch to channel 6, adjust slug then switch back to channel 5 and check picture. Repeat until adjustment is satisfactory. A13 is for adjusting channels 4 and 3 and is adjusted in the same manner switching to channel 4 to adjust channel 3. A14 is for adjusting channel 2.

VHF RF AND MIXER ALIGNMENT FOR TUNERS #T70 AND T81

Disconnect the yellow AGC lead from point (E). Connect the negative lead of a 2.5 volt bias supply to point (E). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 10K to point (F). Low side to chassis.	A15, A16, A17	Adjust for maximum response with markers as indicated, Adjust bandwidth if necessary by moving ground lead of C13 away from ground lug. Moving away from ground lug narrows bandpass. Adjust A17 for maximum response.
10.	"	"	177MC	175.25MC 179.75MC	7	"		Retouch A15 and A16, if necessary for proper response. Recheck channel 13. Continue checking channels 13 and 7 until the setting is found for best overall high channel response.
11.	"	"	85MC	83.25MC 87.75MC	6	"	A18, A19, A20	Adjust for highest narrowest response. The bandwidth may be adjusted by changing the spacing between coils A18 and A19.
12.	"	"	44MC	44.0MC	Any	"	A21	Adjust for MINIMUM response at 44MC

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT FOR TUNERS #T71

Set the fine tuning to the center of its range. Set the channel selector to the highest high band channel operating in the area and adjust the appropriate slug for best picture and sound. Each channel operating in the area must be adjusted in a descending order from the highest to the lowest.
A22 for channels 13 and 12, A23 for channels 11, 10 and 9, A24 for channels 8 and 7, A25 for 6 and 5, and A26 for 4, 3 and 2.
If difficulty is experienced in adjusting for channels 4, 3 or 2, adjust the correct coil for that channel by expanding or compressing coil turns.

VHF RF AND MIXER ALIGNMENT FOR TUNER #T71

Disconnect the white AGC lead from point (G) . Connect the negative lead of a 3 volt bias supply to point (E) . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 10K to point (H) . Low side to chassis.	A27, A28, A29	Adjust A27 for maximum symmetrical response. Adjust A28 for shifting frequency of response curve and A29 to level the peaks. (See Fig. 3).
14.	"	"	177MC	175.25MC 179.75MC	7	"	A30, A31, A32	Adjust A30 to place 175.25MC marker at the peak of curve. Adjust A31 for equal peaks. Adjust bandwidth if necessary by moving ground lead of 33MMF capacitor (A32) with respect to ground strap. Placing lead closer to ground strap broadens bandpass and vice versa. Place markers as shown in Fig. 3. Recheck steps 11 and 12.
15.	"	"	85MC	83.25MC 87.75MC	6	"	A33, A34, A35	Adjust for maximum gain and symmetry of response similar to Fig. 4 with markers as shown. Adjust A33 for maximum gain, A34 and A35 for symmetrical response. A34 shifts frequency and A35 levels peaks.
16.	"	"	79MC	77.25MC 81.75MC	5	"	A36, A37, A38	Adjust in numerical order, first for maximum, then for frequency and then for level peaks. (See Fig. 4.).
17.	"	"	69MC	67.25MC 71.75MC	4	"	A39, A40, A41	"
18.	"	"	63MC	61.25MC 65.75MC	3	"	A42, A43, A44	"
19.	"	"	57MC	55.25MC 59.75MC	2	"	A45, A46, A47	

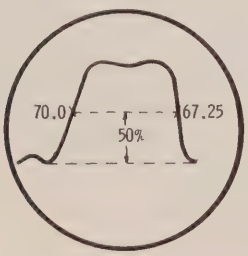


FIG. 1

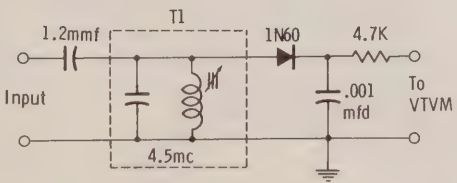


FIG. 2

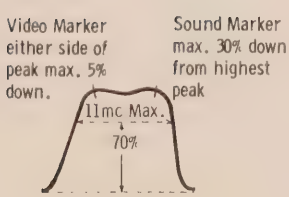


FIG. 3

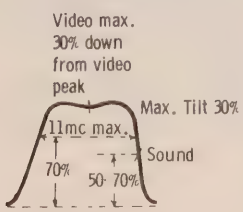
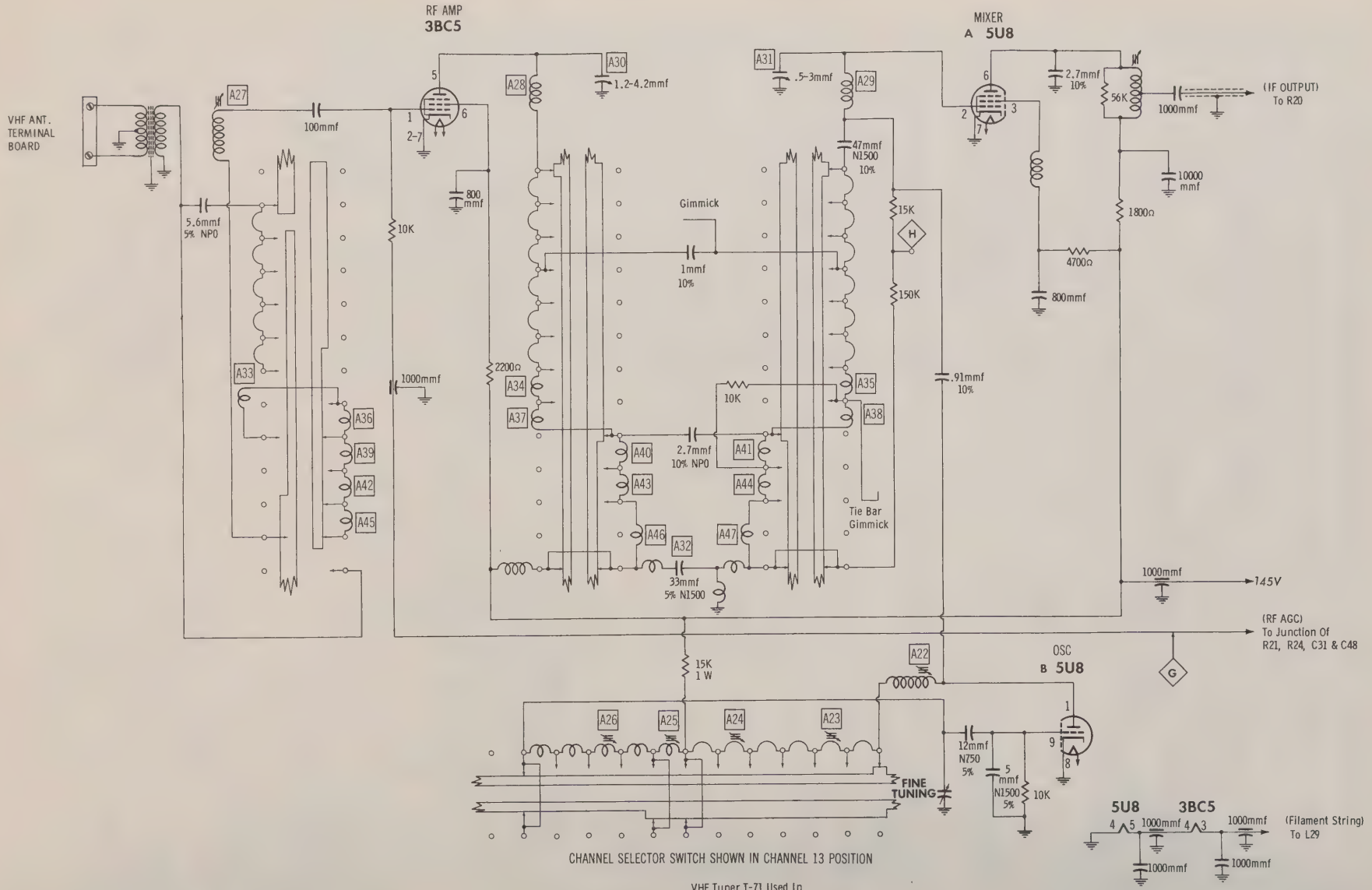


FIG. 4



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

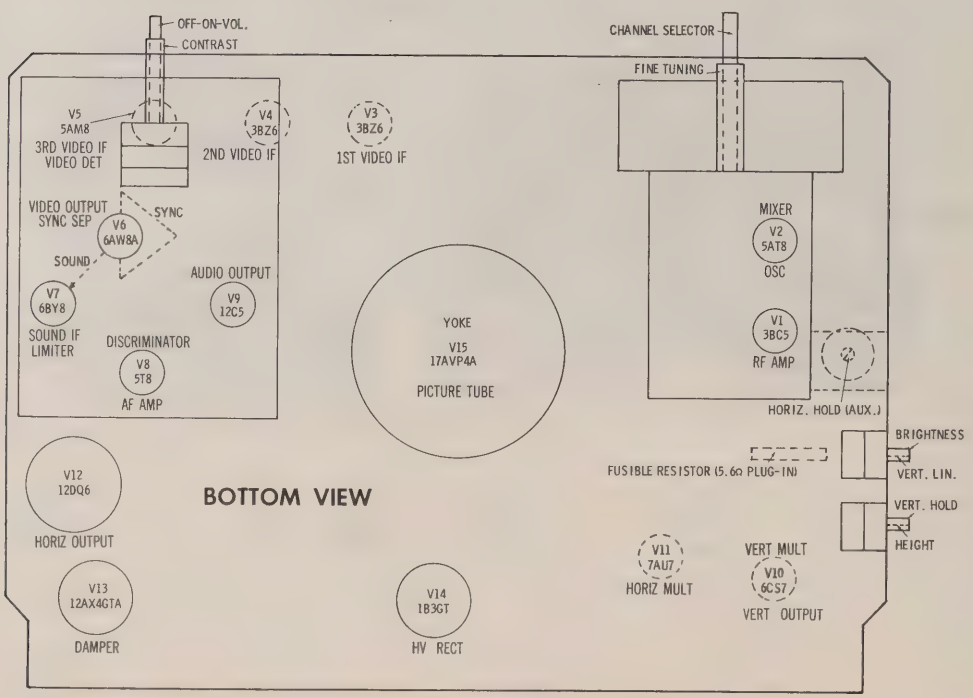
ALTERNATE TUNER SCHEMATIC

CHASSIS BOTTOM VIEW

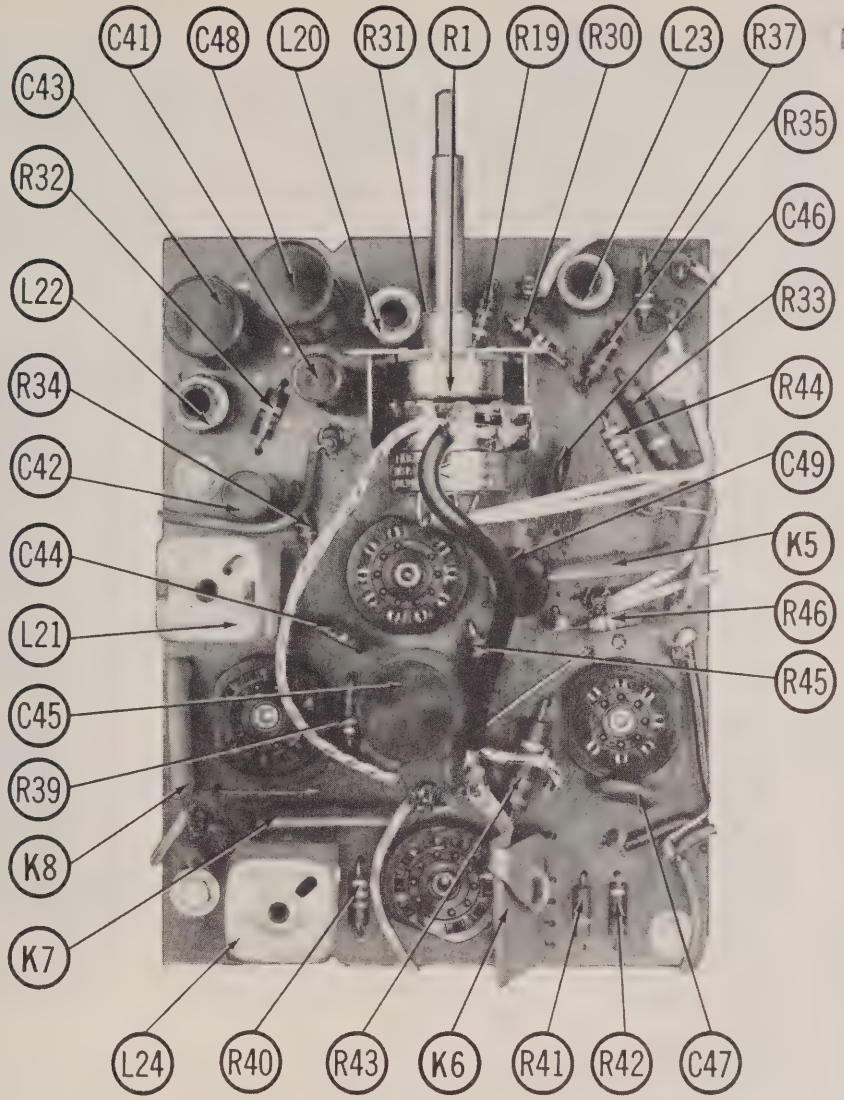
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BC5	1.5Meg	0Ω	2Ω	1.5Ω	† 5000Ω	† 5000Ω	0Ω		
V2	5AT8	15K	† 9700Ω	0Ω	0Ω	1.5Ω	† 6800Ω	† 17K	0Ω	133K
V3	3BZ6	1.5Meg	47Ω	17Ω	16Ω	▪ 660Ω	▪ 660Ω	0Ω		
V4	3BZ6	1.5Meg	68Ω	16Ω	15Ω	▪ 330Ω	▪ 330Ω	0Ω		
V5	5AM8	220Ω	.1Ω	▪ 1000Ω	15Ω	14Ω	▪ 1000Ω	.2Ω	3900Ω	0Ω
V6	6AW8	0Ω	550K	▪ 35K	9Ω	7.5Ω	82Ω	680K	▪ 0Ω	† 5500Ω
V7	6BY8	4.4Ω	0Ω	▪ 147K	7.5Ω	6Ω	▪ 27K	▪ 27K	▪ 27K	330Ω
V8	5T8	100K	100K	170K	6Ω	4.5Ω	0Ω	0Ω	10Meg	† 220K
V9	12C5	15K	550K	9Ω	12Ω	550K	† 40Ω	† 285Ω		
V10	6CS7	ǂ 7400Ω	NC	• 1.7Meg	3Ω	4.5Ω	ǂ• 2.3Meg	100K	• 60K	0Ω
V11	7AU7	† 18K	6.3Meg	1000Ω	3Ω	3Ω	† 52K	• 140K	1000Ω	2Ω
V12	12DQ6	NC	22Ω	NC	† 7800Ω	1.5Meg	TP	20Ω	0Ω	CAP 47Ω
V13	12AX4GTA	NC	NC	¶	NC	† 41Ω	NC	20Ω	17Ω	
V14	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								CAP 345Ω
V15	17AVP4A	12Ω	1Meg	Pin 6 ǂ 6500Ω	Pin 10 ǂ 6500Ω	Pin 11 190K	Pin 12 14Ω			

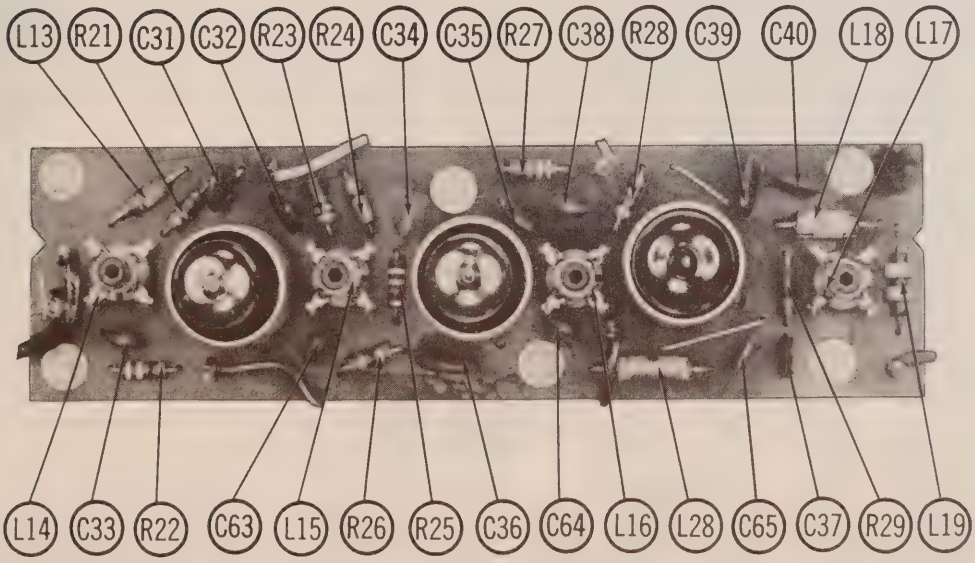
† MEASURED FROM OUTPUT OF M1
ǂ MEASURED FROM PIN 3 OF V13
▪ MEASURED FROM 140V SOURCE
• THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART



SOUND PRINTED BOARD



VIDEO PRINTED BOARD

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	3BC5	
V2	Mixer-Oscillator	5AT8	
V3	1st Video IF Amp	3BZ6	
V4	2nd Video IF Amp	3BZ6	
V5	3rd Video IF Amp		
	Video Detector	5AM8	
V6	Video Output-Sync Sep	6AW8	
V7	Second IF Amp - Limiter	6BH8	

ITEM No	USE	TYPE	NOTES
V8	Discriminator-AF Amp.	5T8	
V9	Audio Output	12C5	
V10	Vert. Mult.-Vert. Output	6C8C	
V11	Horiz Mult	7AU7	
V12	Horiz Output	2DQ6	
V13	Damper	2AX4GTA	
V14	HV Rectifier	1B3GT	

PICTURE TUBE

ITEM No	REPLACEMENT DATA: PHILCO Part No.	GENERAL ELECTRIC Part No.	SYLVANIA Part No.	NOTES
V15		17AVP4A	17AVP4A	1) Silver screen "85"
		17AVP4A-1	17AVP4A-1	2) Aluminized
			17AVP4A,	
		17AVP4	17AVP4	
			17AVP4	
			17AVP4	

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP.	VOLT	REPLACEMENT DATA: PHILCO Part No.	AEROVOX Part No.	CORNELL-DUBILIER Part No.	MALLORY Part No.	PYRAMID Part No.	SANGAMO Part No.	SPRAGUE Part No.
C1	140	150	30-2568-70	AFH51-23	XA025A	FP12T	TM8-34	FM-15150	TVL-1428
C2A	40	300	30-2590-11	AFH4-94-85	CGM69-7		2 MQ-167		R2448 *
B	20	300	(Note 1)		3GR1350		MQ-50-350		
C	10	300							
D	40	475							
C3A	00	300	30-2590-10	AFH2-82-45					R2450 *
B	00	300							

* Non-catalog item
Note 1 Section C2B not used in Ch TH20U

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING: CAP.	VOLT	REPLACEMENT DATA: PHILCO Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C4	220		62-122001001	BPD-00022	DD-221	L10T22	ED-220	UC-5322	SGA-T22	
C5	220		62-122001001	BPD-00022	DD-221	L10T22	ED-220	UC-5322	SGA-T22	
C6	100			BPD-001	DD-101	L10T1	ED-100	UC-531	SGA-T1	
C7	39			BPD-0039	DD-390	L10Q39	ED-39	UC-5439	SGA-Q39	
C8	800		30-1233-7	BPD-0008	DD-801	L10T8	ED-800		SGA-T8	
C9	5-3-.5		31-8530-1				31S-D	CT565A		
C10	330		76-1469-10	BPD-00033	DD-331	L10T33	ED-330	UC-5333	SGA-T33	
C11	68		30-1232-11		TCC-68		TCC-68			
C12	4.7		30-1241-13	NPO-SI 4.7	TCZ-4R7	C10Y4TC	TCO-4.7	Z7-5547	STCCB-Y47	N750 10%
C13	39		76-1469-12							
C14	75		76-1469-13		DD-750	L10Q75	ED-75	UC-5475	SGA-Q75	
C15	1000		30-1245-8	EF-00A	MFT-1000				SGSC-D1	
C16	5-3.0		31-8530-1				31S-D	CT565A		
C17	5.0		76-1469-14	NPO-SI 5.0		C10Y5C	TCO-5		Z7-555	NPO 10%
C18	800		30-1233-7	BPD-0008	DD-801	L10T8	ED-0008		SGA-T8	
C19	10000		30-1238-3	BPD-01	DD-103	BYA681	ED-01	DC511	B1HK-S1	
C20	680		76-1469-9	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	SGA-T68	
C21	39		76-1469-16							
C22	1.5		76-1469-15							
C23	10		76-1469-14	NPO-SI 10	TCZ-10	C10Q1C	TCO-10	Z7-541	STCC-Q1	N1400
C24	8 6		76-1469-15	NPO-SI 6 8	TCZ-6R8	C10Y6SC	TCO-6.8	Z7-5568	STCCB-Y68	NPO
C25	1.5		30-1231-7							
C26	800		30-1233-7	BPD-0008	DD-801	L10T8	ED-0008		SGA-T8	
C27	100		76-1469-17	EF-00	MFT-1000				SGSC-D1	
C28	800		30-1233-7	BPD-0008	DD-801	L10T8	ED-0008		SGA-T8	
C29	1-5		31-8530-9				532-D			
C30	6		30-1234-28		SI 5		D6-050	L10Y5	ED-5	ET-555	SGA-Y5	
C31	1500		30-1262-8	BPD-0015	DD-152	BYA10D15	ED-0015	DC5215	5HK-D15	
C32	680		30-1262-15	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	SGA-T68	
C33	330		30-1262-21	BPD-00033	DD-331	L10T33	ED-330	UC-5333	SGA-T33	
C34	1500		30-1262-8	BPD-0015	DD-152	BYA10D15	ED-0015	UC-5215	5HK-D15	
C35	680		30-1262-15	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	SGA-T68	
C36	27		30-1263-6	SI 27	DD-270	L10Q27	ED-27	UC-5427	SGA-Q27	
C37	680		30-1262-15	BPD-00054	DD-681	L10T68	ED-680	UC-5368	SGA-T68	
C38	1500		30-1262-8	BPD-0015	DD-152	BYA10D15	ED-0015	DC5215	5HK-D15	
C39	1500		30-1262-9	BPD-0015	DD-152	BYA10G15	ED-0015	DC5215	5HK-D15	
C40	5		30-1263	SI 5		D6-050	L10Y5	ED-5	ET-555	SGA-Y5	
C41	033	300	30-4684-27						BC5333J	28E-S33	10%
C42	0033	300	30-4684-47				BC5F1J		ACE4G	46E-P10	
C43	.1	400	30-4684-47				BY A10T47	ED-470	UC-5547	SGA-T47	
C44	470		30-1263-17	BPD-00047	DD-471		BC3P47J			28E-P47	
C45	47	200	30-4695-34				BY A10G33	ED-0033	UC-5333	SGA-G33	
C46	3300		30-1262-25	BPD-0033	DD-333		L10D6			SGA-D6	
C47	600		30-1263-1				BC3P22J		ACD5022	28E-P22	
C48	22	300	30-4684-32				L10D6			SGA-D6	
C49	150		30-1263-14	BPD-00015	DD-151		L10T15	ED-150	UC-5315	SGA-T15	Note 1
C50	01	400		BPD-01	DF-103		CU3B3	GP-10000	GEM-4I	4TM-S1	Note 2
C51	015	300	30-4684-51				BC5S3J			28E-S33	
C52	033	400	30-4684-51				BC5S3J			46E-S33	
C53	6000		30-1262-1				L10D6			SGA-D6	
C54	22	300	30-4684-33				BC3P22J		ACD5022	28E-P22	
C55	6000		30-1262-1				L10D6			SGA-D6	
C56	2200		30-1264-2	1467-0022	DS-222		1WS022	GP-2200	UC-5222	2FM-S22	
C57	68		30-1264-14	1468-000068	DS-680		5WS68	GP-68	UC-5468	1FM-S68	
C58	390		30-1264-1	1468-00039	DS-391		5WS739	GP-390	UC-5339	1FM-S39	
C59	047	400	30-4650-82	BPD-05	DF-503		CU3S47		GEM-4U47	4TM-S47	
C60	033	600	30-4650-55	BPD-03	DF-303		CU3S33		GEM-4U33	4TM-S33	Note 3
C61	82	1000	30-1265-4		DD-820						
C62	.1	800	30-4650-54	P588M-1	DF-104		CU5G9P			GEM-6U1	6TM-P1
C63	1500		30-1262-8	BPD-0015	DD-152		BY A10D15	ED-0015	DC5215	5HK-D15	
C64	1500		30-1262-8	BPD-0015	DD-152		BY A10D15	ED-0015	DC5215	5HK-D15	
C65	1500		30-1262-8	BPD-0015	DD-152		BY A10D15	ED-0015	DC5215	5HK-D15	
C66	330		30-1233-0001	BI 220	D6-221		L10T33	ED-330	UC-5333	SGA-T22	
C67	1000		30-1238-3	BPD-001	DD-103		BY A6U	ED-1000	DC521	5HK-D1	
C68	3000		30-1238-1	BPD-003	DD-302		BY A10G6	ED-003	DC535	5HK-D5	

Note 1 Not used in some versions.
Note 2. Some versions use an 8000MMF (Part #30-1265-1) in this application.
Note 3. Some versions use a .047MFD @ 400V (Part #30-4650-45) in this application.

PARTS LIST AND DESCRIPTIONS

CONTROLS

ITEM No	RATING: RESIST ANCE	WATTS	REPLACEMENT DATA: PHILCO Part No.	CENTRALAB Part No.	CLAROSTAT Part No.	IRC Part No.	MALLORY Part No.	INSTALLATION NOTES
R1A	2Meg		33-5594-2					Contrast
B	1Meg							Volume
C	Switch							
R2A	250K		33-5573-20	F1-54		UB3T8	Brightness	
B	1Meg			R3-51		Hot Req.	Vert Lin.	
R3A	500K		33-5573-21	F1-29		UB1R8	Vert Hold	
B	2 1Meg			R3-78		Hot Req.	Height	
R4A	250K		33-8573	AB-80	A47-350K-B	QU-130	TA3S4L	Horiz. Osc. Aux.
B	Shaft			AK-1	FX2-1/2	RQ	Hot Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING: OHMS	WATT	REPLACEMENT DATA: PHILCO Part No.	IRC Part No.	NOTES
R5	470K		66-4478340	BTS-470K	
R6	470K		66-4478340	BTS-470K	
R7	33K		66-5238340	BTS-33K	
R8	470Ω		66-1478340	BTS-470	
R9	8200Ω		66-2638340	BTS-8200	
R10	100K		66-4108340	BTS-100K	
R11	33K		66-5238340	BTS-33K	
R12	1800Ω		66-2168340	BTS-1800	
R13	27K		66-5278340	BTS-27K	
R14	13K		66-5138340	BTS-13K	
R15	4700Ω		66-2478340	BTS-4700	
R16	15K		66-5158340	BTS-15K	
R17	5000Ω	T	33-1235-96	PWT-5000	Note 1
R18	4. 7Meg		66-5478340	BTS-4. 7Meg	Note 1
R19	1. 8Meg		66-5188340	BTS-1. 8Meg	
R20	10Ω		66-0108340	BTS-10	
R21	33K		66-5238340		
R22	47Ω		66-0478340	BTS-47	
R23	330Ω		66-1338340	BTS-330	
R24	1000Ω		66-2108340	BTS-1000	
R25	47K		66-5478340		
R26	68Ω		66-0688340	BTS-68	
R27	330Ω		66-1338340	BTS-330	
R28	220Ω		66-1228340	BTS-220	
R29	1000Ω		66-2108340	BTS-1000	
R30	3900Ω		66-2398340	BTS-3900	
R31	470K		66-4478340	BTS-470K	
R32	680K		66-4688340	BTS-680K	
R33	1500Ω		66-2158340	BTS-1500	
R34	82Ω		66-0828340	BTS-82	
R35	6800Ω		66-2688340	BTS-6800	
R36	3900Ω	T	33-1235-126	PWT-3900	
R37	150K		66-4158340	BTS-150K	

ITEM No	RATING: OHMS	WATT	REPLACEMENT DATA: PHILCO Part No.	IRC Part No.	NOTES
R38	330K		66-4338340	BTS-330K	
R39	180K		66-4188340	BTS-180K	
R40	27K		66-5278340	BTS-27K	
R42	330K		66-4338340	BTS-330K	
R43	1Meg		66-5108340	BTS-1Meg	
R43	2200	1	66-1228340	BTA-220	
R44	470K		66-4478340	BTS-470K	
R45	68K		66-5688340	BTS-68K	
R46	33K		66-5238340	BTS-33K	
R47	10K		66-5108340	BTS-10K	
R48	33K		66-5338340	BTS-33K	
R49	1Meg		66-5108340	BTS-1Meg	
R50	10K		66-5108340	BTS-10K	
R51	33K		66-5338340	BTS-33K	
R53	1Meg		66-5108340	BTS-1Meg	
R53	3300		66-4338340	BTS-330K	
R54	470K		66-4478340	BTS-470K	
R55	1000Ω		66-2108340		
R56	1000Ω		66-2108340		
R57	3300Ω		66-3338340	BTS-3300	
R58	15K	1	66-5154340		
R62	2200Ω		66-2228340	BTS-1000	
R63	56000	7	33-1235-134	*	Note 2
R64	6500Ω	7	33-1235-125		
R65	100K	1	66-4104340	BTA-100K	
R66	2200Ω		66-2228340		
R67	18K	3	66-5183340	BTB-18K	Note 3
R68	5.6Ω		33-1268-3	FR5.6	
R69	4Ω	20	33-1268-1		
R70	470K		66-4478340	BTS-470K	

Note 1. Not used in Ch TH20U
Note 2. Some versions may use an 8300Ω, 7W (Part #33-1235-119)
Note 3. Not used in Ch. TH20U Some versions of Ch. TH20, TH22 may use a 12K, 2W (Part #66-3125340) in this application.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: PHILCO Part No.	Halldorson Part No.	Merit Part No.	RCA Type No.	Ram Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.
T1	Vert. Output	32-8658-1	Z1804	A-3057	33Z71	V315	A-8Z3	26S52	A-102X
T2A	Yoke-Horiz. (20.5MH	76-1070-1	DF607	MDF-92	23G3	TF0719/43	DY-18A	Y-48	Y-44
B	(90°) Vert (44MH)		① ③	① ③	① ③	① ③	② ③	② ③	NW46 ⊥
T3	Horiz. Output	33-8786-1 ②		RVO-62		Z148 *	SO-384	FLY-130 *	
				* ‡ ‡					
	Alt. Horiz. Output	33-8785		RVO-63		Z184 *	SO-384	FLY-130 *	
				* ‡ ‡					

⊥ Mount with lead out bottom, connect yoke terminal #3 to horizontal output transformer terminal #4, yoke terminal #7 to horizontal output transformer terminal #2, yoke terminal #1 to horizontal output transformer terminal #1. Use original yoke clamp and centering device.
① Use original yoke damping network.
② Includes L25
Drill new mounting hole(s).
‡ This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
7	1		2	12	12		
4	3		1	11	11		
5	3		1	2	13		
3	T	4	4	5	5		
1	4	7	7	8 or 9	8		

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE: PRI	SEC	REPLACEMENT DATA: PHILCO Part No.	Halldorson Part No.	Merit Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.	NOTES
T4	24000	3-4Ω	32-8674-1	Z1801	A-3025	A-3332	26S53	S-12X	

SPEAKER

ITEM No	TYPE: SIZE	FIELD	V C IMP	REPLACEMENT DATA: PHILCO Part No.	QUAM Part No.	NOTES
SP1	4	PM	3-4Ω	30-1855-1	4A07	

COILS (RF-IF)

ITEM No	USE	PHILCO Part No.	NOTES
L1	Ant. Coil	76-11489-1	Includes Ant. board and rear plate assembly
L3	IF Trap	76-11489-5	
L3	Ant. Coils	76-11489-30	Channels 2-13, complete wafer assembly
L4	RF Coils	76-11489-38	Channels 2-13, complete wafer assembly
L5	RF Coil	76-11489-7	
L6	RF Choke	76-11489-35	

ITEM No	USE	PHILCO Part No.	NOTES
L7	Mixer Grid Coils	76-11489-39	Channels 2-13, complete wafer assembly
L8	Mixer Grid Coil	76-11489-6	Channel 12
L9	Osc. Coils	76-11489-19	Channels 2-13, complete wafer assembly
L10	Osc. Coil	76-11489-3	Channel 12, includes front plate assy and tuning stator
L11	Mixer Plate Coil	76-11489-37	

RESISTORS

ITEM No	USE	REPLACEMENT DATA: PHILCO Part No.	MEISSNER Part No.	MERIT Part No.	MILLER Part No.	NOTES
L23	47.35MC Trap Coil	32-4697-1	18-1000	BC-563	6803	1, 2 Microhenries
L23	IF Coupling Coil	32-4645-5				.22 Microhenry
L24	1st. Video IF	32-4695				
L25	2nd. Video IF	32-4686-1				
L26	3rd. Video IF	32-4686-2				
L27	4th. Video IF	32-4686-3				
L28	Resonant Choke	32-4645-7				3 Microhenries
L29	Resonant Choke	32-4647-1		TV-182		33 Microhenries
L30	Shunt Peaking Coil	32-4690-13			6138	470 Microhenries
L2A	4.5MC Trap	32-4688-2				
B	Sound IF					
L32	Shunt Peaking Coil	32-4690-11	18-4400	TV-180	6134	280 Microhenries
L33	Series Peaking Coil	32-4690-11	18-4400	TV-180	6134	280 Microhenries
L34	Sound Discriminator	32-4689				Tertiary winding +1.5D
L35	RF Choke				6152 *	19 Microhenries, wound on 2Ω resistor - Note 1
L36	RF Choke	32-4113-30	19-1006		6836	15 Microhenries
L37	RF Choke	32-4113-30	19-1006		6836	15 Microhenries
L38	Fil. Choke	32-4645-8	18-1002	BC-568	6806	3, 9 Microhenries
L39	Fil. Choke	32-4113-59				3 Microhenries

* Connect in series with 22Ω resistor.
Note 1 Part of horizontal output transformer (T3). Not used in some versions.

TRANSFORMER (HORIZ. OSC.)

ITEM No	DC RES: PRI	SEC	REPLACEMENT DATA: PHILCO Part No.	MEISSNER Part No.	MERIT Part No.	MILLER Part No.	RCA TYPE No	Ram Part No.	Thordarson Part No.	NOTES
L30	1600		32-4672-2							

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RESISTANCE	INDUCTANCE (Ω CURRENT CONSTANT)	REPLACEMENT DATA: PHILCO PART No	Halldorson Part No.	Merit Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.
L31	.340A	60Ω	1 1 HY.	32-8759	C5037 ①	C-2292 ①	C-2326 ①	26C44 ①	C-27X

① Drill new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PHILCO PART No.	REPLACEMENT DATA
K1	Vert. Integrator	2000MMF, 5000MMV, 5000MMF, 22K, 6200Ω, 6200Ω	30-8018	Aerovox Centralab Cornell-Dubilier Erie Sprague
K2	Horiz. AFC	82MMF, 100MMV, 1000MMF, 680K, 4.7Meg, 680K, 220K	30-8016	Centralab Sprague
K3	Vert. Mult. Grid	2000MMF, 10000MMF, 1000MMF, 100K, 100K	30-8015-1 (Note 1)	Centralab Sprague
K4	Horiz Mult. Plate	1000MMF, 1500MMF, 390MMF, 2000MMF, 10K, 39K, 3600Ω	30-8025 (Note 2)	Centralab
K5	Sync Sep Grid	5000MMF, 680MMF, 220K, 10K	30-8019-1	Centralab Sprague
K6	Audio Coupling	5000MMF, 3000MMF, 1 5Meg, 10Meg	30-8022-1	Centralab Sprague
K7	Discriminator	150MMF, 1000MMF, 150MMF, 100K, 100K, 100K	30-8021	Centralab Sprague
K8	Sound IF	5000MMF, 2000MMF, 330Ω, 27K	30-8020	Centralab Sprague
K9	Retrace Suppression	5000MMF, 10000MMF, 10K, 1Meg	30-8024	Centralab Sprague

Note 1. Alternate part number 30-8502-1
Note 2. Alternate part numbers 30-8017-1 and 30-8501-1.

RECTIFIERS

ITEM No	RATING: CURRENT (Measured)	REPLACEMENT DATA: PHILCO Part No.	FEDERAL Part No.	GENERAL ELECTRIC Part No.	INTERNATIONAL Part No.	MALLORY Part No.	SARKES TARZIAN Part No.	NOTES
M1	.340A	30-8059-4 ①	1J36A ①	1N1007 ②	MR300 ①	63300	300 ①	
M2	.340A	30-8059-4 ①	1J36A ①	1N1007 ②	MR300 ①	63300	300 ①	
M3		30-8027-1 ③	1B3 ③		173 ③			

① Selenium type. ② Germanium type. ③ 3 required.

PHILCO MODELS E-3032I, R, E-3034, B, SA, SS, UE-3032I, R, UE-3034B, SA, SS (Ch. 7H20, U, 7H22)

FOLDER 3

PARTS LIST AND DESCRIPTIONS (Continued)

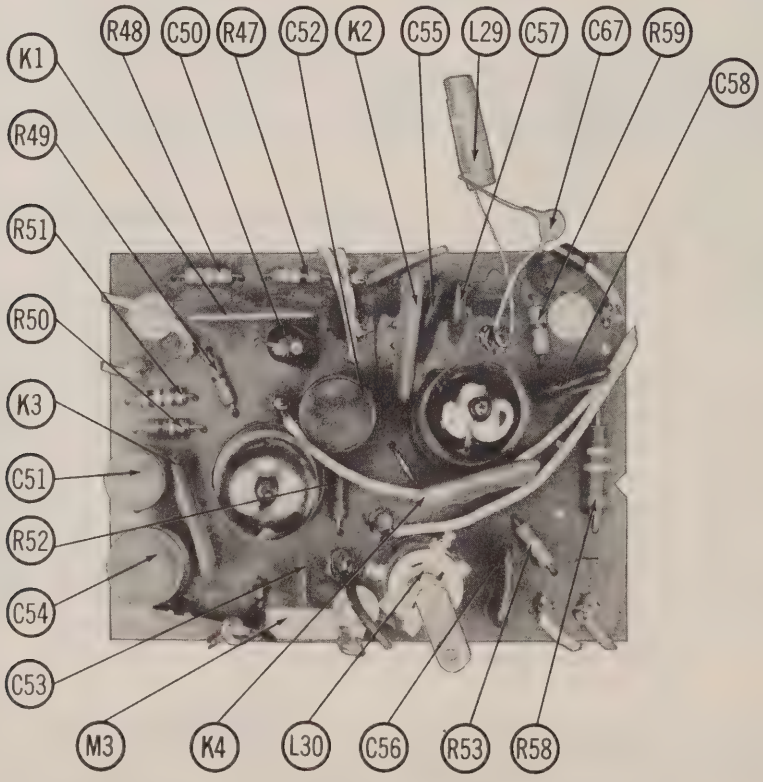
MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M4	Tuner	76-11046	VHF (T-70) Chassis 7H20
	Tuner		VHF (T-71) Chassis 7H22
	Tuner	76-11170	UHF/VHF (T-81) Chassis 7H20U
M5	Centering Device	76-11069	
M6	Ion Trap	76-6077-2	
	Printed Board	54-9792	Video IF Panel
	Printed Board	54-9791	Video Audio Panel
	Printed Board	54-9790-1	Oscillator Panel
	Printed Board	54-5266	Alternate oscillator panel

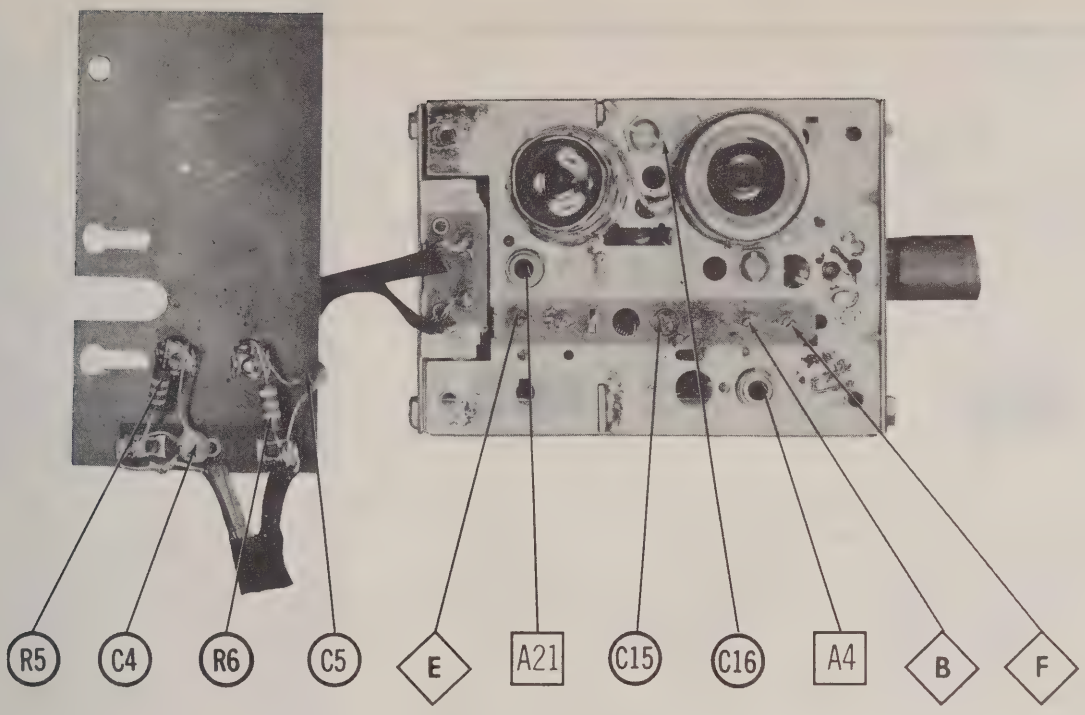
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

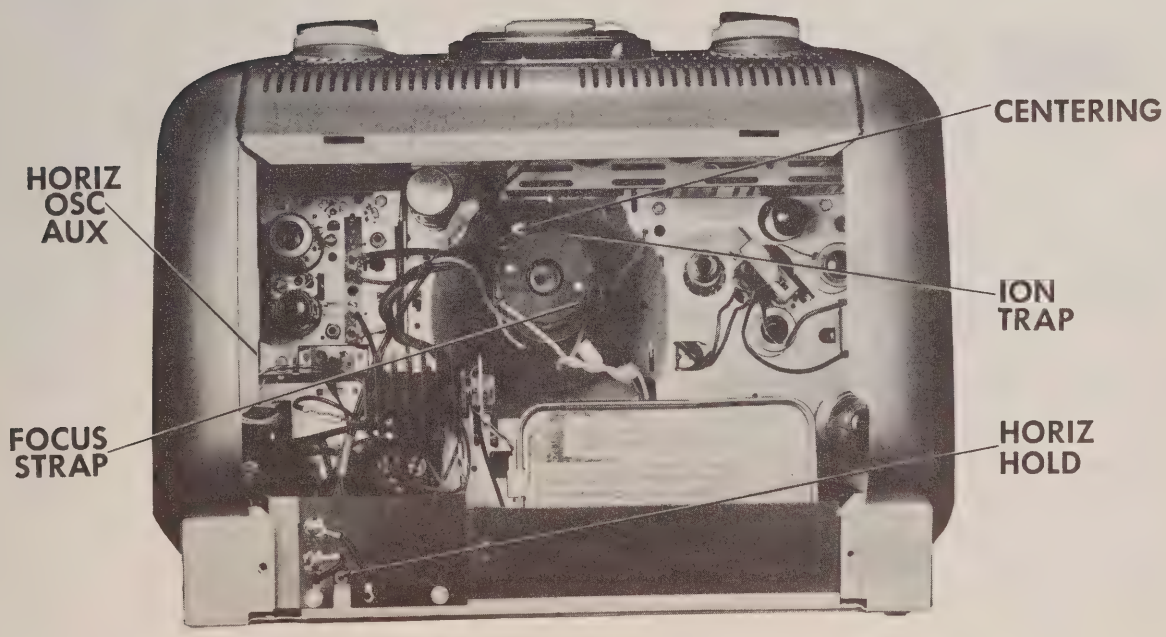
NAME	PART NO.	DESCRIPTION
Safety Glass	549879-2	
Mask	28-11393-6	Models E302I, UE302I
Mask	28-11393-5	Models E3032R, UE3032R
Knob	54-6262-12	Channel Selector - Model E3034B
Knob	54-6261-13	Channel Selector - Model UE3034B
Knob	54-6261-10	Channel Selector - Models E3034SA, SS
Knob	54-6261-11	Channel Selector - Models UE3034SA, SS
Knob	54-6261-24	Channel Selector - Model E3032I
Knob	54-6261-25	Channel Selector - Model UE3032I
Knob	54-6261-14	Channel Selector - Model E3032R
Knob	54-6261-15	Channel Selector - Model UE3032R
Knob	54-6317-2	Fine tuning - Models E3034B, UE3034B
Knob	54-6317-1	Fine tuning - Models E3034SA, SS, UE3034SA, SS, E3032I, UE3032I, E3032R, UE3032R
Knob	54-6318-2	Contrast - Models E3034B, UE3034B
Knob	54-6318-1	Contrast - Models E3034SA, SS, UE3034SA, SS, E3032I, UE3032I, E3032R, UE3032R
Knob	54-6265-4	Brightness - Models E3034B, UE3034B
Knob	54-6265-2	Brightness - Models E3034SA, SS, UE3034SA, SS, E3032I, UE3032I, E3032R, UE3032R
Knob	54-6263-4	On-off-volume - Models E3034B, UE3034B
Knob	54-6263-3	On-off-volume - Models E3034SA, SS, UE3034SA, SS
Knob	54-6263-5	On-off-volume - Models E3032I, UE3032I, E3032R, UE3032R
Knob	54-6265-5	Vert. Hold - Models E3034B, UE3034B
Knob	54-6265-3	Vert. Hold - Models E3034SA, SS, UE3034SA, SS, E3032I, UE3032I, E3032R, UE3032R
Cabinet	11195-6	Model E3034
Cabinet	11195-3	Models E3034B, UE3034B
Cabinet	11195-7	Models E3034SS, UE3034SS
Cabinet	11195-5	Models E3034SA, UE3034SA
Cabinet	11195-11	Models E3032I, UE3032I
Cabinet	11195-9	Models E3032R, UE3032R
UHF Drive Assy.	76-11033-2	Includes knob - Models UE3034B, UE3034SA, SS
UHF Drive Assy.	76-11033-1	Includes knob - Models E3032I, UE3032I, E3032R, UE3032R



SWEEP PRINTED BOARD



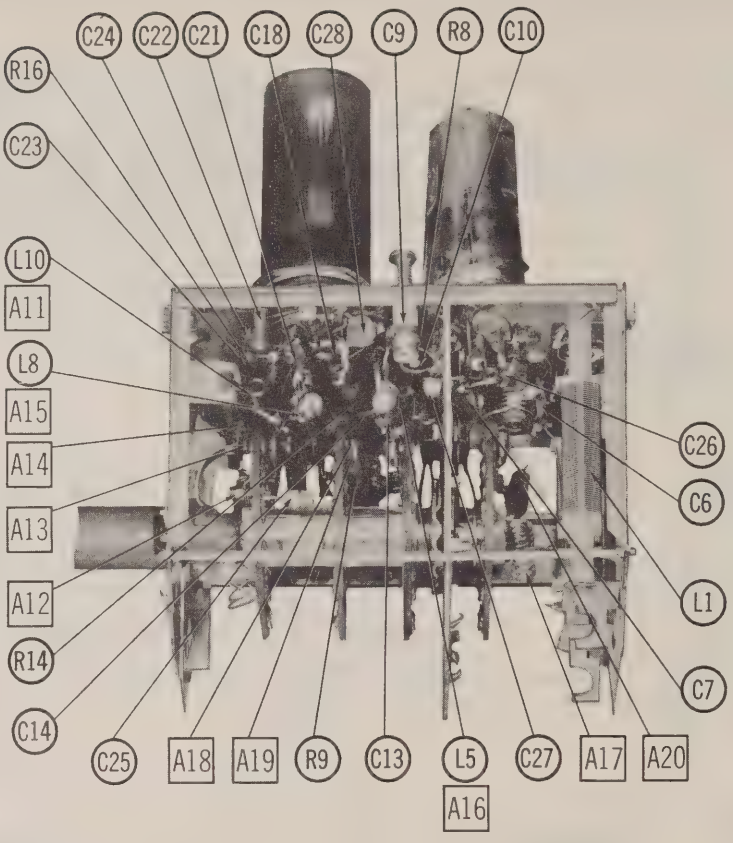
TUNER TOP VIEW



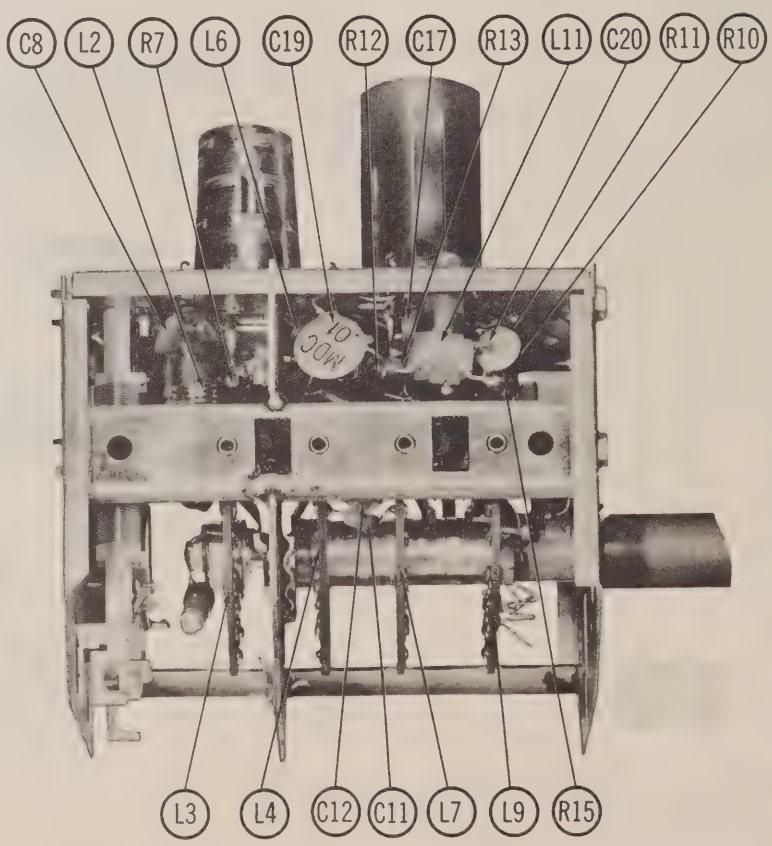
CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Set the horizontal oscillator auxiliary control (R4) to the center of its range and adjust the horizontal hold slug (B1) to synchronize the picture horizontally. Check lock-in action by switching off channel and back again. Retouch B1, if necessary.



TUNER-LEFT SIDE

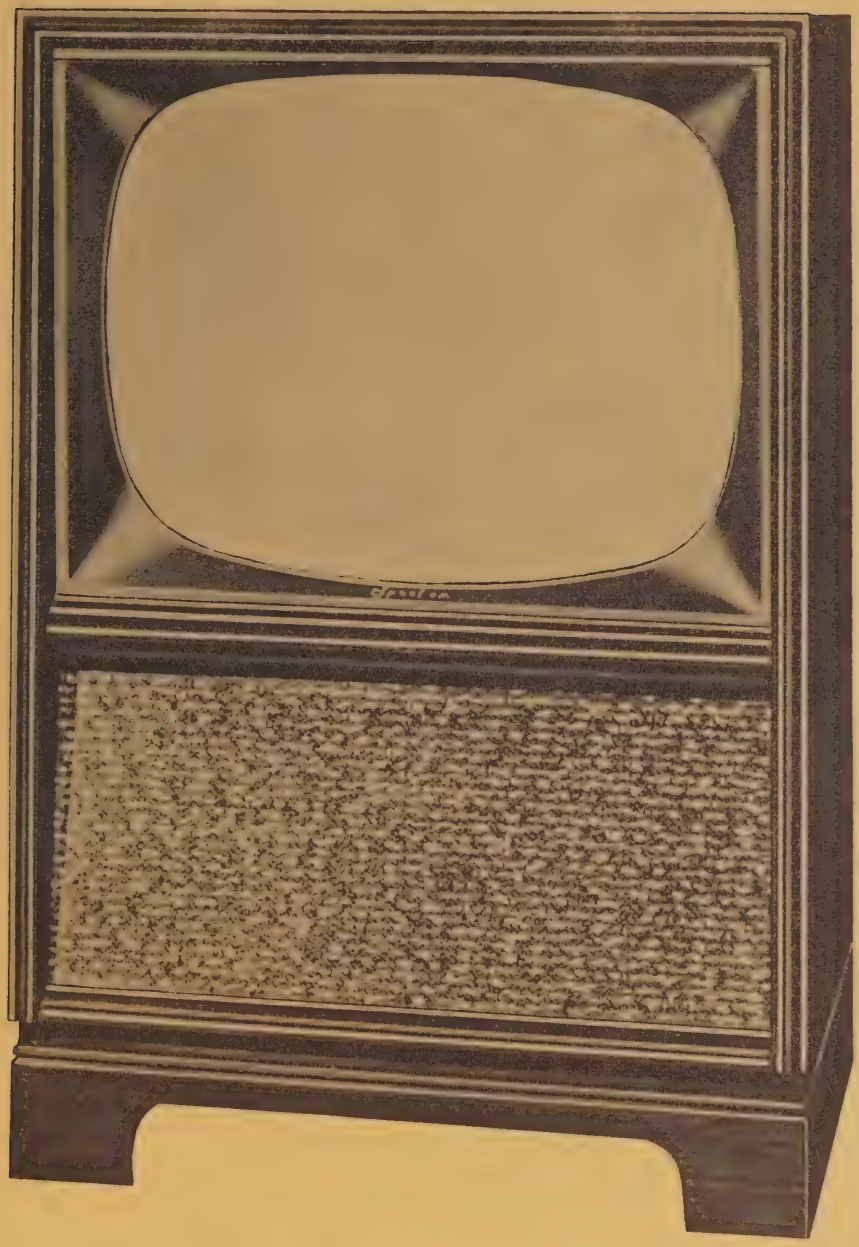


TUNER-RIGHT SIDE

PHOTOFACT* Folder

*TRADE MARK

DENVER, COLORADO



SPARTAN CHASSIS CMUA/CTA487DC, ED, CMUA/CTA490DC, CMUA/CTA491DC, CMUA/CTA499DC, ED, CMUA/CTA501DC, CMUE/CTE493DC, CMUD/CTD495DC (117 Series)

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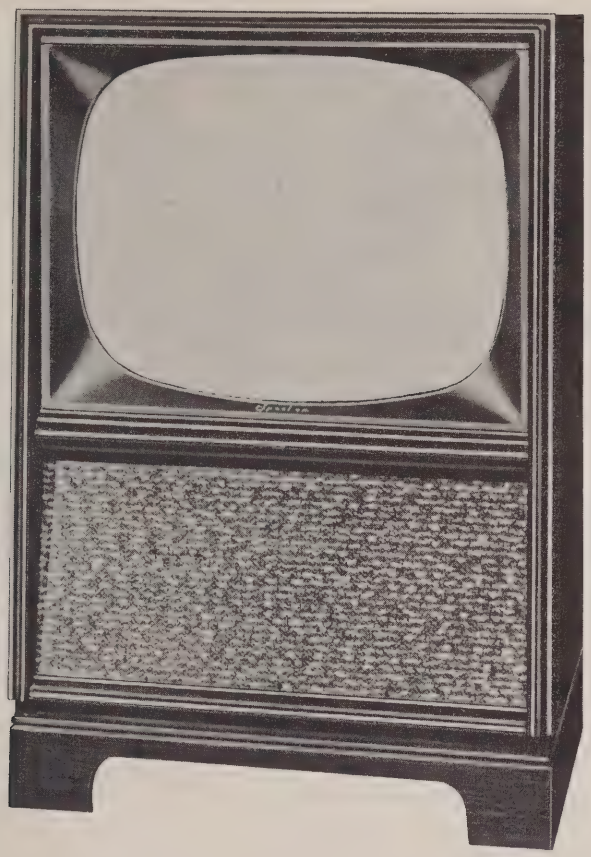
PHOTOFACT* Folder

*TRADE MARK



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SPARTAN CHASSIS CMUA/CTA487DC, ED, CMUA/CTA490DC, CMUA/CTA491DC, CMUA/CTA499DC, ED, CMUA/CTA501DC, CMUE/CTE493DC, CMUD/CTD495DC (117 Series)

TRADE NAME	Spartan	CHASSIS CMUA487DC, ED, CMUA490DC, CMUA491DC, CMUA499DC, ED, CMUA501DC, CMUD495DC, CMUE493DC, CTA487DC, ED, CTA490DC, CTA491DC, CTA499DC, ED, CTA501DC, CTD495DC, CTE493DC (117 Series)
MANUFACTURER	Spartan Div., The Magnavox Co., Fort Wayne 4, Indiana	
TYPE SET	Television Receiver	
TUBES	Twenty	
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 190 Watts, 1.7 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)	

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments (located in a circle around the shaft) should be made in sequence from the highest to the lowest channel in the area. Adjust for best picture and sound.

FOCUS

Adjust the ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Set the horizontal hold at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the discriminator secondary (A13) located on top of the chassis.

FUSES

One fuse is used for horizontal sweep circuit protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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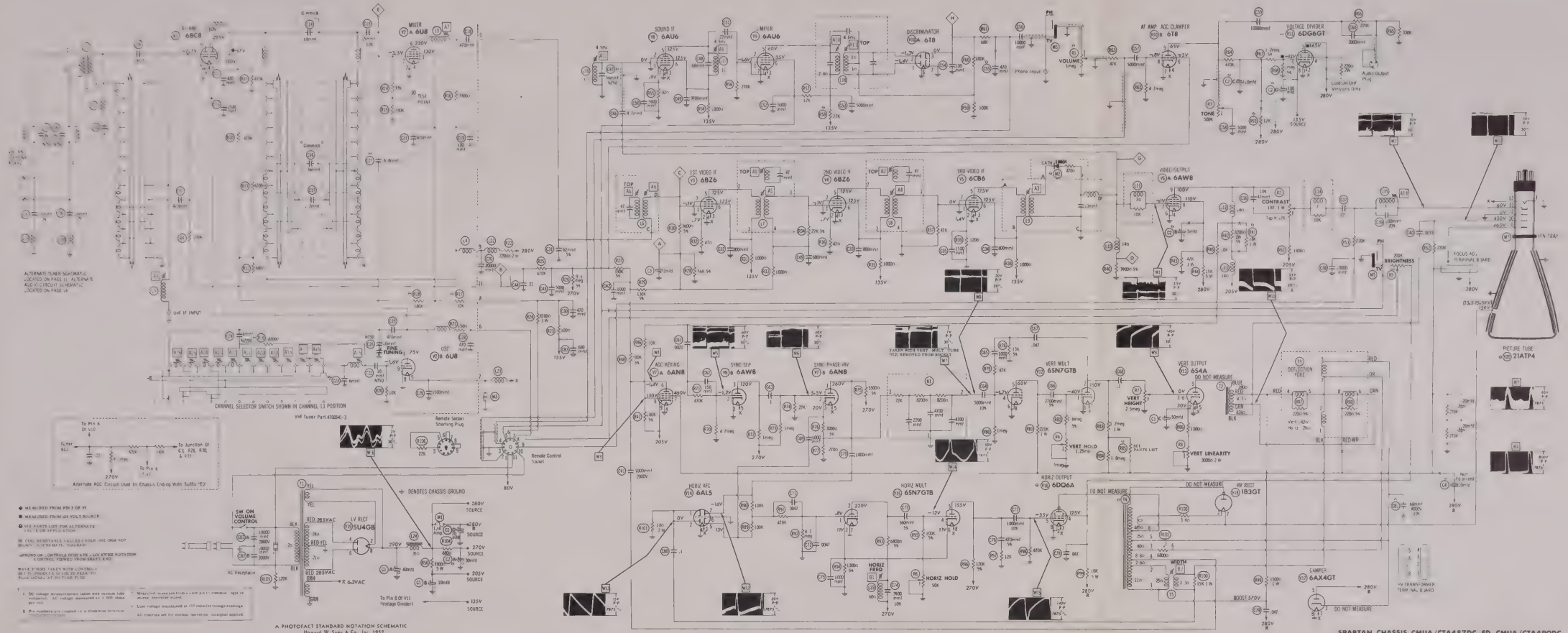
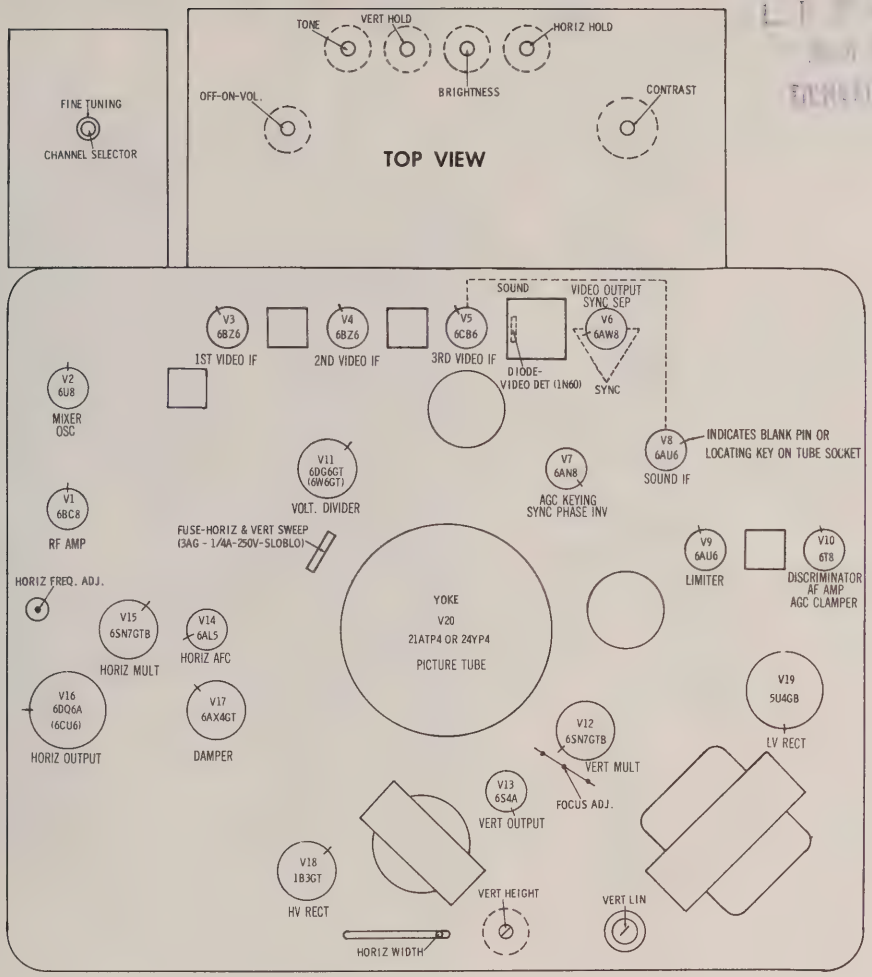
G943R

FOLDER 4


A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957
SPARTAN CHASSIS CMUA/CTA487DC, ED, CMUA/CTA490DC, CMUA/CTA491DC, CMUA/CTA499DC, ED, CMUA/CTA501DC, CMUE/CTE493DC, CMUD/CTD495DC (117 Series)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

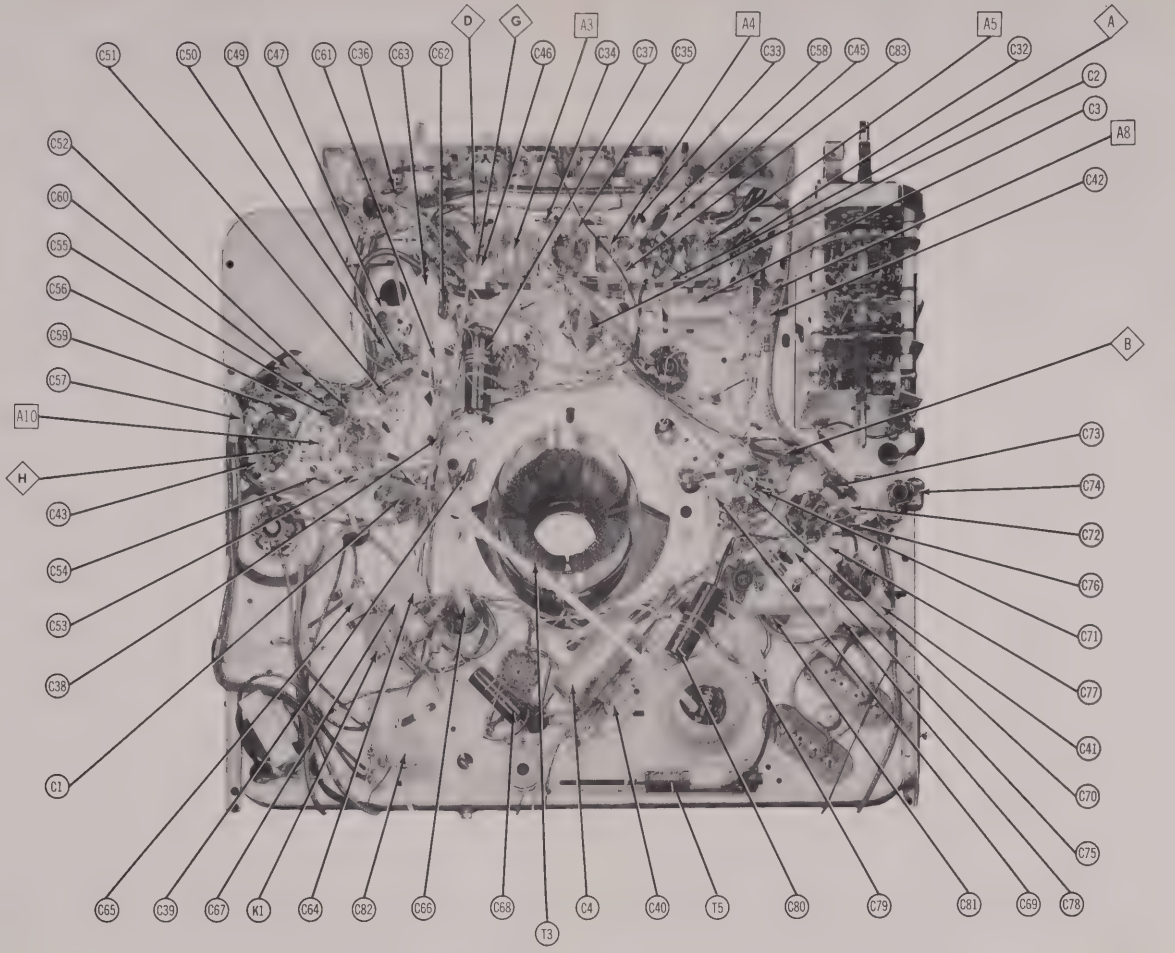
The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V19**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, Diode (M2), V11**
No pic, no sound, has snow - **V1, V2, V3, V11**
No pic, has sound, has raster - **V6, V20**
Has pic, no sound - **V8, V9, V10, V11**
Overloaded picture - **V7**

SYNC FAILURE
No vert. sync - **V6, V7**
No horiz. sync - **V6, V7, V14**
No vert. or horiz. sync - **V6, V7**

SWEEP FAILURE
No raster, has sound - **Fuse (M1), V14, V15, V16, V17, V18, V20**
No vertical deflection - **V12, V13**
Poor vert. linearity or foldover - **V12, V13**
Poor horiz. linearity or foldover - **V15, V16, V17**
Narrow picture - **V15, V16, V17, V19**
Vert. off freq. - **V12**
Horiz. off freq. - **V15**



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

SPARTAN CHASSIS CMUA/CTA4897DC, ED, CMUA/CTA490DC, CMUA/CTA491DC, CMUA/CTA499DC, ED, CMUA/CTA501DC, CMUE/CTE492DC, CMUD/CTD492DC (117 Series)

FOLDER 4

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓐ. Positive to chassis.
Connect the negative lead of a 1.5 volt bias supply to point Ⓑ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	1000MMF	High side to point Ⓒ. Low side to chassis.	43.0MC (10MC Swp)	47.25MC	Any non-interfering channel	Vert. Amp. thru 10K to point Ⓓ. Low side to chassis.	A1, A2	Adjust sweep so that 47.25MC trap is visible. Adjust A1 and A2 to place marker in trap notch as in Fig. 1. This may be done with slugs at two different positions. Use position with slugs farthest out of coil forms.
2.	"	"	"	42.25MC 45.0MC 45.75MC	"	"	A3, A4, A5	Adjust for response similar to Fig. 2. Adjust A3 for maximum gain, A4 to place 45.75MC marker at 50% on curve and A5 to place 42.25MC at 50% on opposite side of curve. Recheck 47.25MC traps.
3.	"	High side to point Ⓔ. Low side to chassis.	"	41.25MC	"	"	A6	Adjust sweep so that 41.25MC trap notch is visible. Adjust A6 to place marker in trap notch as in Fig. 3. This may be done with slug in two positions. Use the one with slug farthest from coil.
4.	"	"	"	41.25MC 42.25MC 45.0MC 45.75MC 47.25MC	"	"	A7, A8	Adjust A7 for maximum gain with 45.75MC marker at 50% as in Fig. 2. Adjust A8 for maximum gain and proper tilt. It may be necessary to repeat these two adjustments. Recheck step 3.
5.	1000Ω Carbon Resistors	High side to point Ⓕ. Low side to chassis.	"	"	UHF	"	A9	Adjust for response similar to Fig. 2 with MINIMUM tilt.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.005MFD	High side to point Ⓖ. Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point Ⓗ. Low side to chassis.	A10, A11, A12	Adjust for maximum deflection. Use only enough sweep generator output to provide a usable indication on VTVM.
7.	"	"	"	"	"	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ALIGNMENT

Tune in a TV station and tune the fine tuning slowly clockwise until 4.5MC beat interference becomes visible in the pattern. Adjust A14 until the horizontal scanning lines are smooth and continuous.

VHF OSCILLATOR ALIGNMENT

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Set the fine tuning control to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Fig. 4	Across VHF antenna terminals thru matching network (Fig. 4).	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point Ⓓ. Low side to chassis.	A15	Adjust to place sound marker in trap notch as in Fig. 5. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A16	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A17	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A18	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A19	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A20	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A21	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A22	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A23	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A24	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A25	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A26	

UHF TUNER AND VHF RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

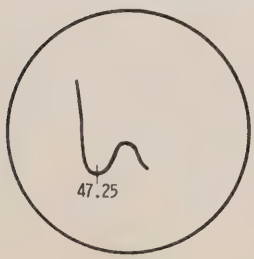


FIG. 1

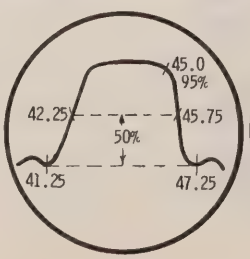


FIG. 2

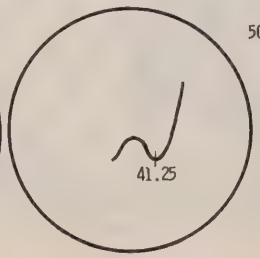


FIG. 3

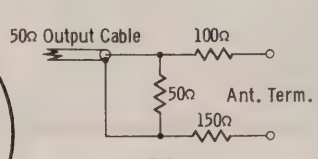


FIG. 4

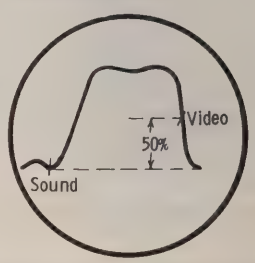
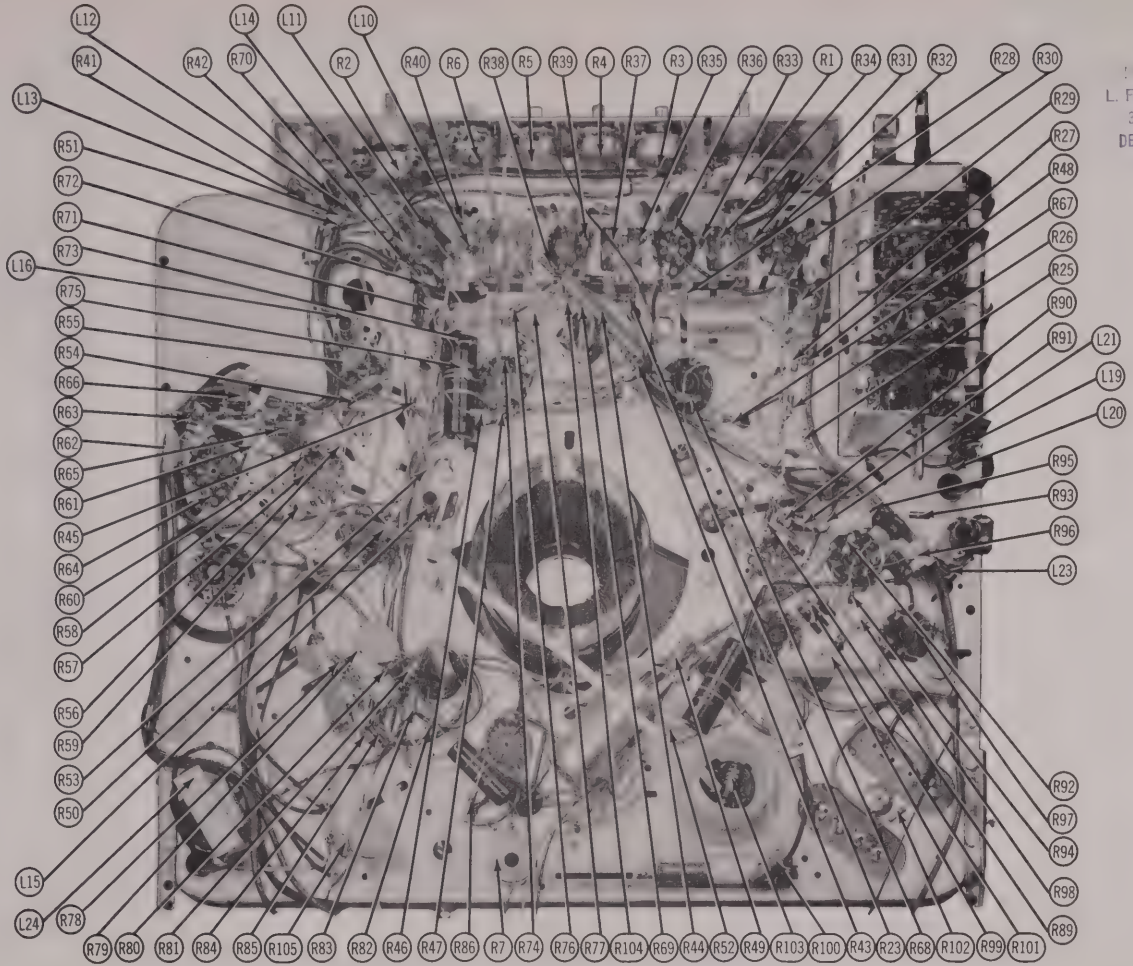


FIG. 5

CHASSIS TOP VIEW

SPARTAN CHASSIS CMUA/CTA487DC, ED, CMUA/CTA490DC, CMUA/CTA491DC, CMUA/CTA499DC, ED, CMUA/CTA501DC, CMUE/CTE493DC, CMUD/CTD495DC (117 Series)

FOLDER 4



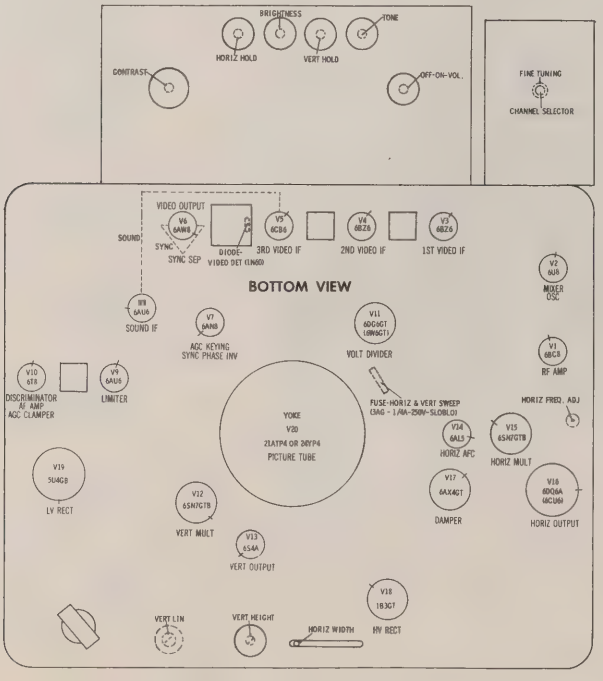
CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

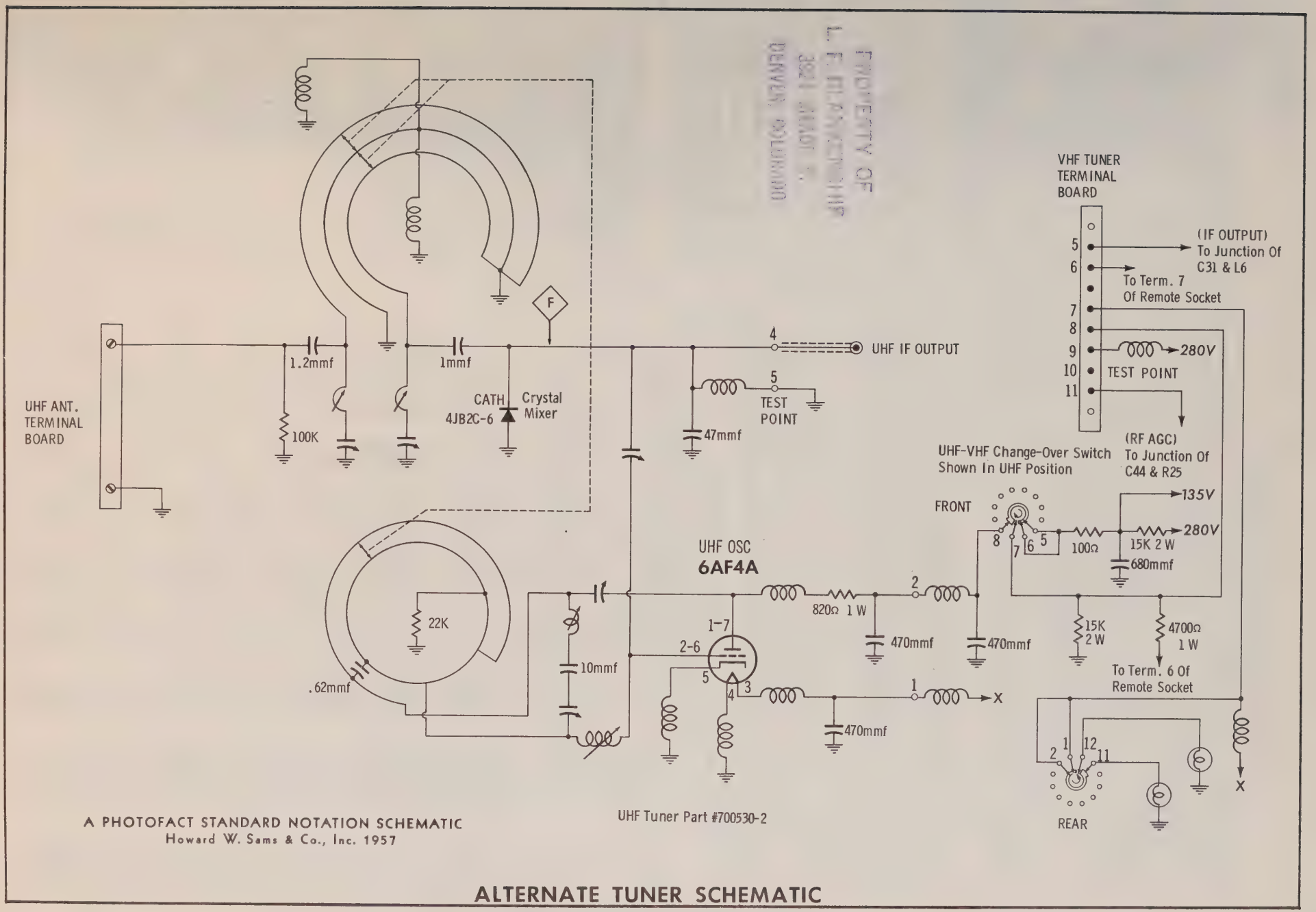
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BC8	† 2200Ω	230K	INF	0Ω	.1Ω	INF	1Meg	0Ω	0Ω
V2	6U8	▪ 4800Ω	360K	▪ 10K	0Ω	.1Ω	† 6500Ω	0Ω	0Ω	10K
V3	6BZ6	60K	47Ω	.1Ω	0Ω	▪ 1000Ω	▪ 1000Ω	0Ω		
V4	6BZ6	57K	47Ω	.1Ω	0Ω	▪ 1000Ω	▪ 1000Ω	0Ω		
V5	6CB6	.1Ω	120Ω	.1Ω	0Ω	▪ 1000Ω	▪ 1000Ω	0Ω		
V6	6AW8	0Ω	4.7Meg	† 1Meg	0Ω	.1Ω	0Ω	3900Ω	† 12K	† 7500Ω
V7	6AN8	† 3800Ω	22K	3300Ω	0Ω	.1Ω	280K	ǂ 1500Ω	† 35K	† 3300Ω
V8	6AU6	1Ω	0Ω	.1Ω	0Ω	▪ 1000Ω	▪ 1000Ω	82Ω		
V9	6AU6	270K	0Ω	.1Ω	0Ω	▪ 27K	▪ 39K	0Ω		
V10	6T8	100K	100K	200K	.1Ω	0Ω	460K	0Ω	4.7Meg	† 470K
V11	6DG6GT	NC	.1Ω	† 35Ω	† 35Ω	1Meg	TP	0Ω	¶	
V12	6SN7GTB	•1.8Meg	ǂ 1.7Meg	0Ω	1Meg	ǂ 270K	0Ω	.1Ω	0Ω	
V13	6S4A	NC	•2100Ω	•1.1Meg	0Ω	.1Ω	•1.1Meg	NC	NC	ǂ 2800Ω
V14	6AL5	18Ω	18Ω	.1Ω	0Ω	5.3Meg	0Ω	5.3Meg		
V15	6SN7GTB	4.7Meg	† 7800Ω	1300Ω	•110K	† 120K	1300Ω	0Ω	.1Ω	
V16	6DQ6A	TP	0Ω	TP	† 10K	470K	TP	.1Ω	0Ω	TOP CAP ǂ23Ω
V17	6AX4GT	NC	NC	¶	NC	† 35Ω	NC	.1Ω	0Ω	
V18	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ǂ 510Ω
V19	5U4GB	NC	¶	NC	24Ω	TP	21Ω	NC	¶	
V20	21ALP4A B	0Ω	0Ω	Pin 6 ǂ 1500Ω	Pin 10 ǂ 270K	Pin 11 260K	Pin 12 .1Ω			

TP TIE POINT
NC NO CONNECTION.
† MEASURED FROM PIN 8 OF V19.
• THIS READING WILL VARY CONTROL SET FOR NORMAL OPERATION.
▪ MEASURED FROM 135V SOURCE.
ǂ MEASURED FROM PIN 3 OF V17.
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.



TUBE PLACEMENT CHART



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

UHF Tuner Part #700530-2

ALTERNATE TUNER SCHEMATIC

SPARTAN CHASSIS CMUA/CTA487DC, ED, CMUA/CTA490DC, CMUA/CTA491DC, CMUA/CTA499DC, ED, CMUA/CTA501DC, CMUE/CTE493DC, CMUD/CTD495DC (117 Series)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	6BC8	
V2	Mixer-Osc.	6U8	
V3	1st. Video IF Amp.	6BZ6	
V4	2nd. Video IF Amp.	6BZ6	
V5	3rd. Video IF Amp.	6CB6	
V6	Video Output Sync Sep.	6AW8	
V7	AGC, Keying-Sync Phase Inverter	6AN8	
V8	Sound IF Amp.	6AU6	
V9	Limiter	6AU6	
V10	Discriminator-AF Amp.-AGC Clamper	6T8	
V11	Voltage Divider	6DG6GT	Note 1
V12	Vert. Mult.	6BH7GB	
V13	Vert. Output	6BQ6A	
V14	Horiz. AFC	6AL5	
V15	Horiz. Mult.	6BH7GB	
V16	Horiz. Output	6JQ6A	Note 2
V17	Damper	6AX4GT	
V18	RF Rectifier	1N82T	
V19	LV Rectifier	5U4GB	

Note 1. Some versions may use a 6WG7T in this application.
Note 2. Some versions may use a 6CU6 or 6JQ6 in this application.

PICTURE TUBE

ITEM No	REPLACEMENT DATA			NOTES
	SPARTAN PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	
V20	21ATP4	21ATP4A, 21ATP4	21ATP4 1 21ATP4A 2 21ATP4A 2 24VP4 ③	1 Aluminized 2 Silver Screen 85°

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						
	CAP	VOLT	SPARTAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	⌀40	350	27008I-52	RE1008	DO450 BR403S	TP385.5 TP239	TMQ-40-350 TQ-40-350	Q-03 MT-4810	TVL-4631
B	⌀10	350							
C	50	50							
D	⌀70	350							
C2A	⌀30	350	27008I-57 Note 1	AFH4-56-93.4	CO360 BR046	FP420.33	T-725 MT-4804		TVL-4634.7
B	⌀30	350							
C	⌀10	350							
D	100	300							
C3	3	350	27008T-23	SRE50Y3	BBR3-50	TC303	TD-3-50	MT-0502	TVA-1301
C4	10	350	27007T-26 † Note 2	PRS350VNP	BR2045 BR2045	TC65 * TC65		MT-4520 * MT-4520	R2527 * † †

Note 1. Chassis ending in suffix "ED" use a 30-30-5MFD ③ 350V and 100MFD ③ 300V (part #27008I-84) in this application.
Note 2. Not used in chassis ending with suffix "ED".
† Non-polarized unit.
* Non-clamp item.
■ Connect negative leads together

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	SPARTAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	15		23020I-84			TCZ-15				5%
C6	18		23020T-84			TCZ-15				5%
C7	39		23017I-30	N750-SI 39	C10Q39U	TCT-39				N750
C8	39		23017S-20	N750-SI 39	TCN-39	CU039U	TCT-39			N750
C9	10		23020I-437		HI 10	DM-10D	LT50J	UC-441	SGA-4S	
C10			23018I-6							
C11	470		23017S-8	BP00-0047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C12	470		23017S-8	BP00-0047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C13	1500		23017S-10	BP00-0015	DD-152	BYA10D15	ED-1500	DC5215	5MK-D15	
C14	470		23018I-4							
C15	15		23020T-5	MP0-SI 15	TCZ-15	C10Q15C	TCC-15		STCC-Q15	10%
C16	2.5		23018I-15							
C17	1.2		23022I-115	NP0-SI 1.0	TCZ-1	CTA5Y1SC	TCC-1			
C18	470		23017S-24	BP00-0047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C19	100		23017S-24	BP00-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C20	20000		23017S-34	BP00-02	DD-203	BYB502	ED-02		5HK-S2	
C21	470		23017S-8	BP00-0047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C22	10		23020I-136	N750-SI 10	TCN-10	CTA8Q1U	TCT-10	NT-541	5TCU-Q1	N750
C23	150		23020I-143							N220
C24	1		23008I-144							N2200
C25	470		23017S-8	BP00-0047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C26	10		23008I-136	N750-SI 10	TCN-10	CTA8Q1U	TCT-10	NT-541	5TCU-Q1	N750
C27	6.8		23022I-125	NP0-SI 6.8	TCZ-6R8	CTA6Y8SC	TCC-6.8	ZT-5562	5TCCB-V68	Note 1
C28	470		23017S-8	BP00-0047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C29	1500		23017S-10	BP00-0015	DD-152	BYA10D15	ED-1500	DC5215	5MK-D15	
C30	470		23017S-8	BP00-0047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C31	62		23022S-325	1469 000062	TCZ-62	22R562	TCC-62		MS-462	5%
C32	800		23020I-14	BP00-008	DD-801	L10T8	ED-0008		5GA-T8	
C33	800		23020I-14	BP00-008	DD-801	L10T8	ED-0008		5GA-T8	
C34	800		23020I-14	BP00-0008	DD-801	L10T8	ED-0008		5GA-T8	
C35	1500		23020I-18	BP00-0015	DD-152	BYA10D15	ED-1500	DC5215	5MK-D15	
C36	47		23022S-422	NP0-SI 47	TCZ-47	C10Q47C	TCC-47		STCC-Q47	10%
C37	2.2	400	23021I-15	24BH-22		CUB6P22		GEM-4022	4TM-P22	
C38	10000		23017S-6	BP2I-01	DD-103	BYA6S1	ED-01	DC511	5HK-01	
C39	100		23023S-530	1468-0001	DD-101	23R51	ED-100	MC-335	1FM-31	
C40	.0033	600	23001I-4	CI 3300	CUB6D33	GP-3300	ED-332	GEM-4333	6TM-D333	
C41	1000	2000	23017S-27	HVD-30-1000	DD30-102		HD3-1000		20MKD-D1	
C42	500		23017S-28	BP00-005	DD-501	BYA6D1	ED-005	DC521	5HK-D1	
C43	5000		23017S-30	BP00-005	DD-502	BYA6D5	ED-005	DC525	5HK-D5	
C44	.22	200	23020I-15	P28BK-22		CUB6P22		GEM-2022	2TM-P22	
C45	68		23017S-8	BP00-0068	DD-681	BYA10T68	ED-680	UC-5368	SGA-T68	
C46	4.7		23022I-123	NP0-SI 4.7	TCZ-4R7	C10V47C	TCC-4.7	ZT-5547	5TCCB-V47	
C47	68		23022S-183	N750-SI 56	TCN-56	C10Q56C	TCT-56			N750 Note 2
C48	68		23021S-7	BP00-00068	DD-680	L10J68	ED-68	UC-5468	SGA-G68	
C49	5000		23017S-31	BP00-005	DD-502	L10Z30	ED-005	DC-524	5GA-D39	
C50	5000		23017S-1	BP00-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C51	33		23020T-49	SI 33	D5-220	L70G22	GP-33	UC-5432	5GA-G22	
C52	5000		23017S-1	BP00-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C53	5000		23017I-1	BP00-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C54	5000		23020T-48	SI 100	D5-310	L70T1	GP-100	UC-5301	5GA-T1	
C55	470		23023S-15	BP00-0047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	Note 3
C56	5000		23017S-2	BP2I-01	DD-103	BYA6S1	ED-01	DC521	5HK-S1	
C57	5000		23017S-1	BP00-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C58	5000		23017S-30	BP00-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	Note 4
C59	10000		23017S-2	BP2I-01	DD-103	BYA6S1	ED-01	DC521	5HK-S1	
C60	2000		23021S-18	BP00-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C61	.0022	400	23021I-3	SI 3300	D5-222	CUB6D22	GP-2200	GEM-4222	6TM-4D22	
C62	150		23022S-534	BP00-00015	DD-151	BW5T15	ED-150	UC-5315	1FM-315	
C63	.1	400	23021I-13	P4BH-1		CUB4P1		GEM-401	4TM-P1	
C64	5000		23021S-8	1464-005		LD5D25				10%
C65	1000		23021S-8	BP00-001	DD-102	BYA6D1	ED-001	DC521	5HK-D1	

CAPACITORS (cont)

ITEM No	RATING		REPLACEMENT DATA							NOTES
	CAP	VOLT	SPARTAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C66	3700		3500I-0048	1464-0027		LR5D37			MS-237	5%
C67	.047	400	23021S-7	BP0-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C68	.1	400	23021I-13	P4BH-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C69	100		23021S-8	BP00-001	DD-103	BYA6D1	ED-001	DC521	5HK-D1	
C70	1000		23021S-8	BP00-001	DD-103	BYA6D1	ED-001	DC521	5HK-D1	
C71	.0047	400	23021Z-4	SI 4700	D5-472	CUB6J47	GP-4700	GEM-6247	6TM-D47	
C72	.0047	200	23021S-3	SI 4700	D5-472	CUB6D47	GP-4700	GEM-6247	6TM-D47	
C73	680		23023S-343	1464-00036		LR5D68			MS-338	5%
C74	3900		23023S-488	1464-0039		LR5D39			MS-339	10%
C75	1000		23021S-8	BP2I-01	DD-103	BYA6S1	ED-001	DC521	5HK-01	
C76	470		23023S-346	1464-00047		LR5T47			MS-347	5%
C77	1000		23021S-8			LR5D1	GP-1000	MCR25I		10%
C78	.047	400	23021I-12	BP0-05	DF-05	CUB4S47		GEM-4147	4TM-S47	
C79	.047	400	23021I-12	BP0-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C80	1	600	23021I-17	P5BBK-1		CUB5P1		GEM-501	6TM-P1	
C81	68	4000	23017S-23		† P2034CM-01				30HKD-B5	10% Note 5
C82A	10000	3000	23021S-2		† P2036CM-01				30HKD-B5	
B	10000	2000			† P2034CM-01				30HKD-B5	
C83	680		23021S-6	BP00-0068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68	

Note 1. Chassis with tuners 700941-2 and 700941-4 use a 6MFF N330 capacitor in this application.
Note 2 Chassis ending with suffix "ED" use a 68MMF (Part #21-518-7) in this application.
Note 3. Not used in Ch. CTA/CMUA487, 491, 492, 501. Ch. CTA/CMUA490 use a 100MMF (Part #280307-46) in this application.
Note 4. Ch. CTA/CMUA use a 1000MMF (Part #23017S-33) in this application.
Note 5. Chassis ending with suffix "ED" use a 47MMF ③ 4000V (Part #23017S-32) in this application.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SPARTAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	23013S-1	B-70	A4T-1Meg-2	Q13-137	U53	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			ED-1	EWS-12	76-1	US-28	
R1A	1Meg	½	23018S-46	B-70	A4T-1Meg-2	Q13-137	U53	Volume - Note 1
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			ED-1	EWS-12	76-1	US-28	
R2	1SK	1	23013I-7					Contrast Tap@ 12K
R3A	500K	½	23013S-4	B-50	A4T-500K-2	Q13-153	TA55A	Tone
B	Shaft			Not Req.	FXS-1/4	Not Req.	Not Req.	
R4A	1.25Meg	½	23013S-3	B-X4	A4T-1.5Meg-2	Q1-135	TA135L	Vert Hold
B	Shaft			Not Req.	FXS-1/4	Not Req.	Not Req.	
R5A	200K-S	½	23013S-2	BX-66	A4T-200K-S	Q1-139	U43	Brightness
B	Shaft			Not Req.	FXS-1/4	Not Req.	Not Req.	
R6A	50K	½	23013S-1	BX-51	A4T-50K-S	Q1-133	TA54L	Horiz. Hold
B	Shaft			Not Req.	FXS-1/4	Not Req.	Not Req.	
R7A	2.5Meg	½	23014S-3	B-83	A4T-2.5Meg-S	Q1-139	TA255L	Vert Height
B	Shaft			Not Req.	FXS-1/4	Not Req.	Not Req.	
R8A	2000	2	22012O-3		39-2000		FL-4K	Vert Lin. -Wire Wound

Note 1. Alternate part number used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SPARTAN PART No.	IRC PART No.	
R9	100K		23010I-68	BTS-100K	
R10	470K		23010I-94	BTS-470K	
R11	470K		23010I-94	BTS-470K	
R12	680		23010I-60	BTS-680	
R13	82000		23010I-73	BTS-8200	
R14	33K		23010I-78	BTS-33K	
R15	330K		23010I-93	BTS-330K	
R16	33000		23010I-90	BTS-3300	
R17	10K		23010I-74	BTS-10K	Note 1
R18	180K		23010I-84	BTS-180K	Note 2
R19	4700Ω		23010I-70	BTS-4700	Note 3
R20	10K		23010I-74	BTS-10K	
R21	150Ω		23010I-53	BTS-150	
R22	2300Ω	2	23008I-66	BTS-2200	
R23	100Ω		23010I-50	BTS-100	
R24	4700Ω	1	23010S-70	BTA-4700	
R25	470K		23010I-94		
R26	9.4Meg	5%	23010I-214	BTS-234	
R27	330K	5%	23009I-219		
R28	580K	5%	23009I-220	BTS-56K 5%	
R29	130K	5%	23009I-210	BTS-130K 5%	
R30	3900Ω	5%	23009I-172		
R31	1000Ω		23010I-62	BTS-1000	
R32	47Ω		23010I-46	BTS-47	
R33	1000Ω		23010I-62		
R34	22K	5%	23009I-191	BTS-22K 5%	
R35	1000Ω		23010I-62	BTS-1000	
R36	47Ω		23010I-46	BTS-47	
R37	47K		23009I-199	BTS-47K 5%	
R38	1000Ω		23010I-62	BTS-1000 5%	
R39	120Ω		23010I-51	BTS-120	
R40	39000	5%	23009I-177	BTS-39000 5%	
R41	18K	1	23010S-77	BTA-18K	Note 4
R42	82000	5%	23009I-208	BTS-82000 5%	Note 5
R43	47K	1	23010S-82	BTA-47K	
R44	15K	5	24007I-35	1 3/4A-15K	
R45	10K		23010I-74	BTS-10K	
R46	33K		23010I-80	BTS-33K	
R47	100K	5%	23009I-207		
R48	100K	5%	23009I-207		
R49	150Ω	1	23010S-54	BTA-150Ω	
R50	2300Ω	5	24007I-34	9WT-2300	
R51	1800Ω		23010I-65	BTS-1800	
R52	270K		23010I-91	BTS-270K	
R53	220K		23010I-90	BTS-220K	
R54	1000Ω		23010I-49	BTS-1000	
R55	82Ω		23010I-49	BTS-82	
R56	270K		23010I-91	BTS-270K	
R57	12K		23010I-75	BTS-12K	
R58	27K		23010I-79	BTS-27K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SPARTAN PART No.	IRC PART No.	
R59	100K		23010I-68	BTS-100K	
R60	100K		23010I-68	BTS-100K	
R61	68K		23010I-84	BTS-68K	
R62	4.7Meg		23010I-106	BTS-4.7Meg	
R63	47K		23010I-82	BTS-47K	
R64	470K		23010I-94	BTS-470K	
R65	330K		23010I-93	BTS-330K	
R66	270K		23010I-90	BTS-270K	
R67	1.2Meg	5%	23009I-223	BTS-1.2Meg 5%	
R68	1Meg	5%	23009I-231	BTS-1Meg 5%	
R69	12K		23010I-75	BTS-12K	Note 4
R70	4.7Meg		23010I-106	BTS-4.7Meg	
R71	470K		23010I-94	BTS-470K	
R72	1Meg		23010I-98	BTS-1Meg	
R73	1Meg		23010I-98	BTS-1Meg	
R74	12K		23010I-75	BTS-12K	
R75	3200Ω	5%	23009I-175	BTS-3200 5%	
R76	3000Ω	5%	23009I-170	BTS-3000 5%	
R77	270Ω		23010I-52	BTS-270	
R78	13K	5%	23009I-186	BTS-13K 5%	
R79	47K		23010I-82	BTS-47K	
R80	1Meg		23010I-98	BTS-1Meg	
R81	270K	1	23010S-91	BTA-270K	
R82	5.6Meg	5%	23009I-226	BTS-5.6Meg 5%	
R83	1.2Meg	1	23010S-90	BTA-1.2Meg	
R84	1.8Meg		23010I-102	BTS-1.8Meg	
R85	WTC		23013S-3		Note 6
R86	1000Ω		23010I-62	BTS-1000	
R87	220Ω	5%	23009I-143		
R88	330Ω	5%	23009I-145		
R89	100K		23010I-68	BTS-100K	
R90	100K		23010I-68	BTS-100K	
R91	470K		23010I-94	BTS-470K	
R92	4.7Meg		23010I-106	BTS-4.7Meg	
R93	6800Ω	5%	23009I-179		
R94	1300Ω	5%	23009I-182	BTS-1300 5%	
R95	100K	5%	23009I-207	BTS-100K 5%	
R96	120K	5%	23009I-209	BTS-120K 5%	
R97	12K		23010I-75	BTS-12K	
R98	470K		23010I-94	BTS-470K	
R99	12K	5	24007I-9	9WH-10K	
R100	15K	1	23010S-76	BTA-15K	
R101	18Ω	3	23010S-41	BTB-18	
R102	6800Ω		23010I-73	BTS-6800	
R103	3.3Ω		23010T-3	BW1-3.9	
R104	680Ω		23010I-50	BTS-680	
R105	120K		23010I-1	BTS-120K	
R106	22K		23010I-78	BTS-22K	

Note 1. Some versions may use a 100K in this application.
Note 2. Some versions may use a 82K in this application.
Note 3. Some versions may use a 5800Ω in this application.
Note 4. Not used in chassis ending with suffix "ED".
Note 5. Chassis ending with suffix "ED" use a 5600Ω, 5% (Part #240073-3) in this application.
Note 6. This a special temperature compensating resistor, approximately 800K, cold.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	SPARTAN PART No.	Hallicrafters PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	① 117VAC	580VCT	5V	6.3V	30009I-1					R-84-BC
	① 1.7A	② .355A	③ 3A	④ 9.7A						1

① Fahrieste mounting.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							
		SPARTAN PART No.	Hallicrafters PART No.	Merit PART No.	RCA TYPE No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	Vert. Output	C-32035S-3							
T3	Yoke-Horiz. (21MHz (90°) Vert. (45MHz)	3606T-1 ①	DP80T ②	MDF-92 ②	225DI 2	Y90B19 43	DY-16A 2	Y-16 2	Y-41 2
T4	Horiz. Output	3606S3		X152		A-8295 *	FLY-79 *	D-92	
T5	All Horiz. Output	3606S2-1		X152		A-8295 *	FLY-79 *	D-92	
T6	Width Coil	3606S5-2		MWC-103			WC-24	WC-24 314	

① Includes resistors R87 and R88.
2 Use original yoke damping network.
3 Use original core.
④ Use original mounting bracket.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed.

ORIGINAL TERMINAL CONNECTIONS	Hallicrafters Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
8				8	8		
5		5		5	5	6	
3				3	3		
4		4		4	2		
2		2		2	2		
1		1		1	1		
Connect Width Coil Across	1 & 2				1 & 2	1 & 2	
Special Notes					③		

③ If insufficient width, connect capacitor (approx. 50-100MMF ④ 4KV), across horizontal yoke

COILS (RF-IF)

ITEM No.	USE	SPARTAN PART No.	NOTES
L1	Ant. Trans.	3604S1-2	
L2	RF Choke	3606S1-8	4 7 Microhenries IRC Part #CLA

ITEM No.	USE	SPARTAN PART No.	NOTES
L3	UHF IF Input Coil	3604S9-1	
L4	RF Choke	3606S1-9	
L5	Mixer Plate Coil	3604S1-1	

ITEM No.	USE	REPLACEMENT DATA				NOTES
		SPARTAN PART No	MEISSNER PART No	MERIT PART No	MILLER PART No	
L6	1st Video IF	3604S4-1				Includes 41. 25MC Trap
L7	2nd Video IF	3604S4-3		17-4521		Includes 47. 25MC Trap
L8	3rd Video IF	3604S4-4		17-4521		Includes 47. 25MC Trap
L9	4th Video IF	3604S4-1				Includes Cap. Resistor, RF Choke, And M2
L10	Shunt Peaking Coil	3606S2-7		19-4400	8136	400 Microhenries
L11	Series Peaking Coil	3606S2-13		19-3100*	8112*	100 Microhenries, Wound On 10K Resistor
L12	Shunt Peaking Coil	3606S2-7		19-4400	8136	400 Microhenries
L13	Shunt Peaking Coil	3606S2-7		19-4400	8136	400 Microhenries
L14	Series Peaking Coil	3606S2-13		19-3100*	8112*	100 Microhenries, Wound On 10K Resistor
L15	4.5MC Trap	3605S4-1		20-1004	TV-151	1469
L16	1st Sound IF	3605S4-1		20-1004	TV-151	1469
L17	2nd Sound IF	3605S4-1		20-1004	TV-151	1469
L18	Det-Trimmator	3606S2-1		17-3496	TV-134	6204
L19	IF Trap	3606S0-1				6804
L20	IF Trap	3606S0-1				6804
L21	RF Choke	3606S1-1				.47 Microhenry, IRC Part #CLA
L22	RF Choke	3606S1-1				.47 Microhenry, IRC Part #CLA

* Parallel With 10K Resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES		REPLACEMENT DATA						NOTES
	PRI	SEC	SPARTAN PART No	MEISSNER PART No	MERIT PART No	MILLER PART No	RCA TYPE No	Ram PART No	Thordarson PART No	
L23	500		3605T9-1		TV-165			H3-7*		22-76 Muhlenheim

* Drill new mounting hole

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE @ CURRENT 1000 °(.)	SPARTAN PART No	Hallicrafter PART No.	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
L24	265A	35Ω	5Hy.	3200S8-3		C-5037 1	C-2996 1	C-2326 1	26C44 1	C-37X 1

① Drill one new mounting hole.

SPARTAN CHASSIS CMUA/CTA487DC, ED; CMUA/CTA490DC, CMUA/CTA491DC, CMUA/CTA492DC, ED; CMUA/CTA501DC, CMUE/CTE493DC, CMUD/CTD495DC (117 Series).

FOLDER 4

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SPARTAN PART No.	REPLACEMENT DATA
K1	Vertical Integrator	2200MMF, 4700MMF, 4700MMF 22K, 8200Ω, 8200Ω	250186-1	Sprague V-1 Centralab PC-100

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SPARTAN PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	1/4A 125V S/B	180157-30		313.250 (3AG 1/4A S/B	357001	MDL 1/4	4405

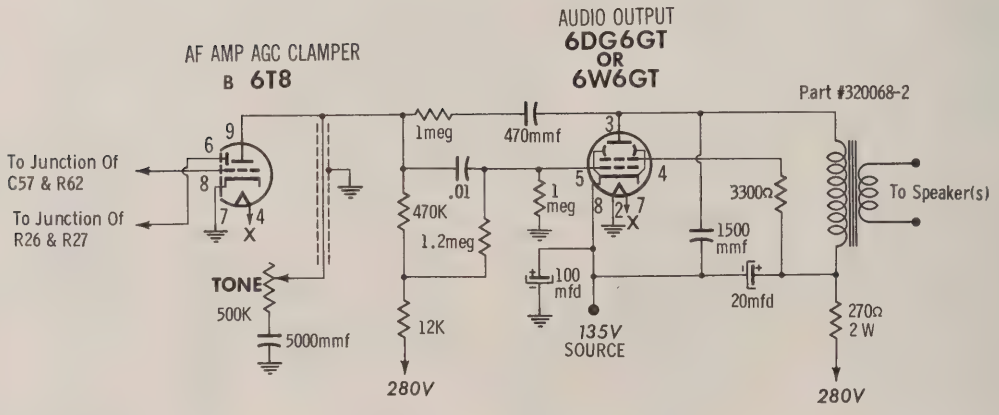
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		SPARTAN PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N60 *		1N60	1N60	Video Det. (Pigtail)

* A 1N64 may be used in some versions.

MISCELLANEOUS

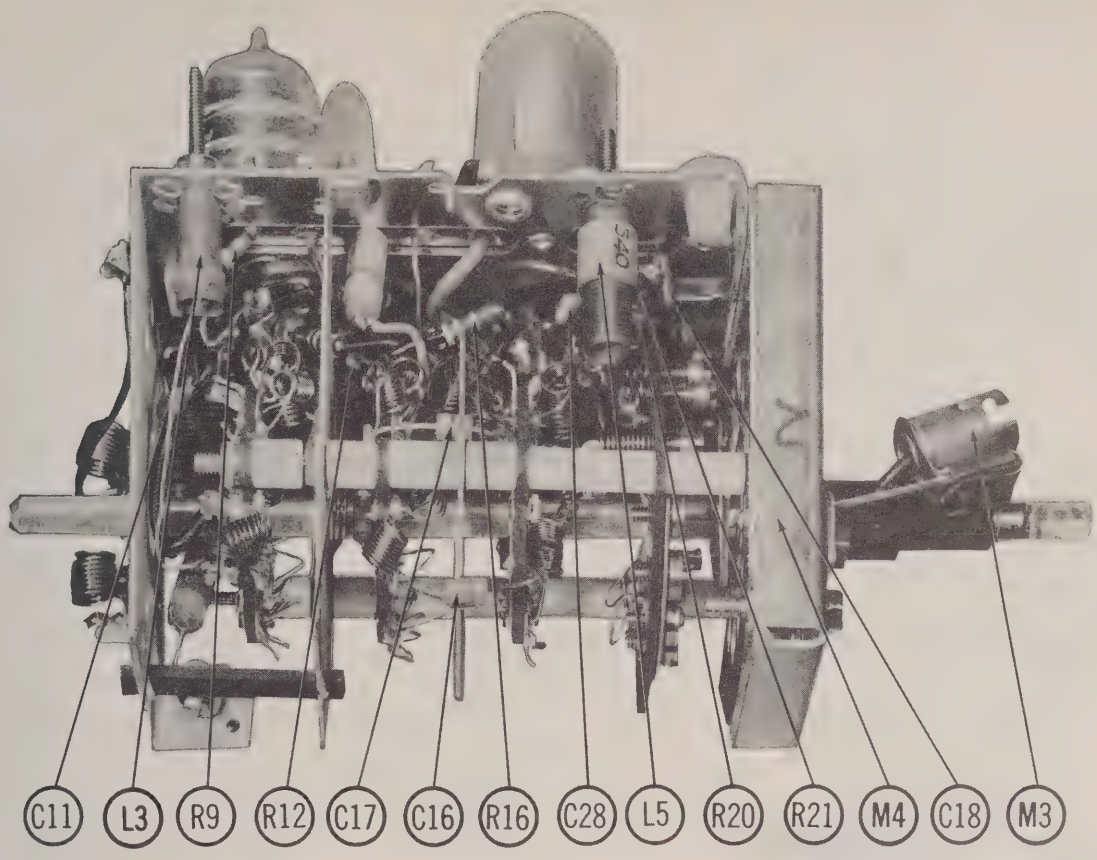
ITEM No.	PART NAME	SPARTAN PART No.	NOTES
M3	Pilot Light		
M4	Tuner	700541-3	VHF
	Tuner	700530-2	UHF
M5	Switch	160232-1	Phono-TV Slide Type (DPDT) Ch. CTD/CMUD 495DC
	Switch	160229-1	Phono-TV Slide Type (DPDT) Ch. CTA/CMUA 501DC
M6	Centering Device	635116-1	
M7	Ion Trap	360492-7	Chassis CTA/CMUA491DC, CTD/CMUD495DC
		360492-5	Chassis CTA/CMUA487DC, ED, 490DC, 499DC, ED, 501DC, CTE/CMUE493DC



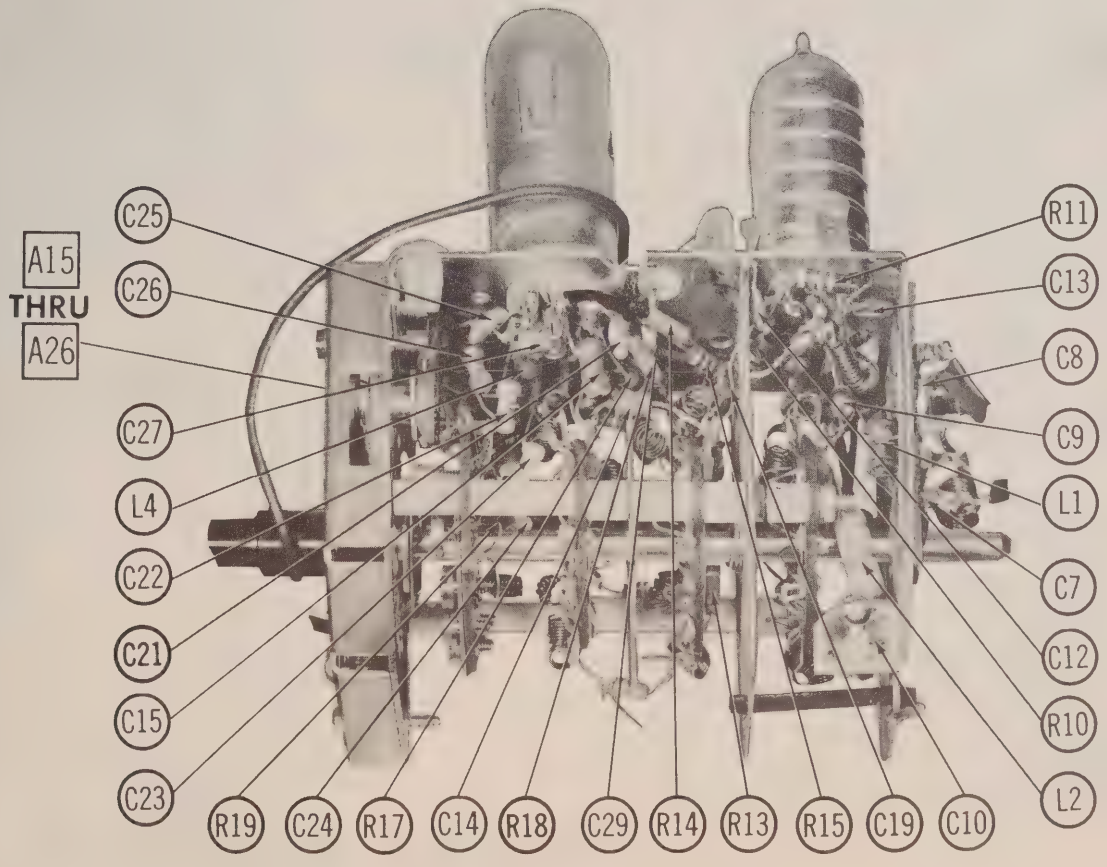
Audio Amp & Audio Output
Circuit Used In Some Versions

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

ALTERNATE AUDIO CIRCUIT

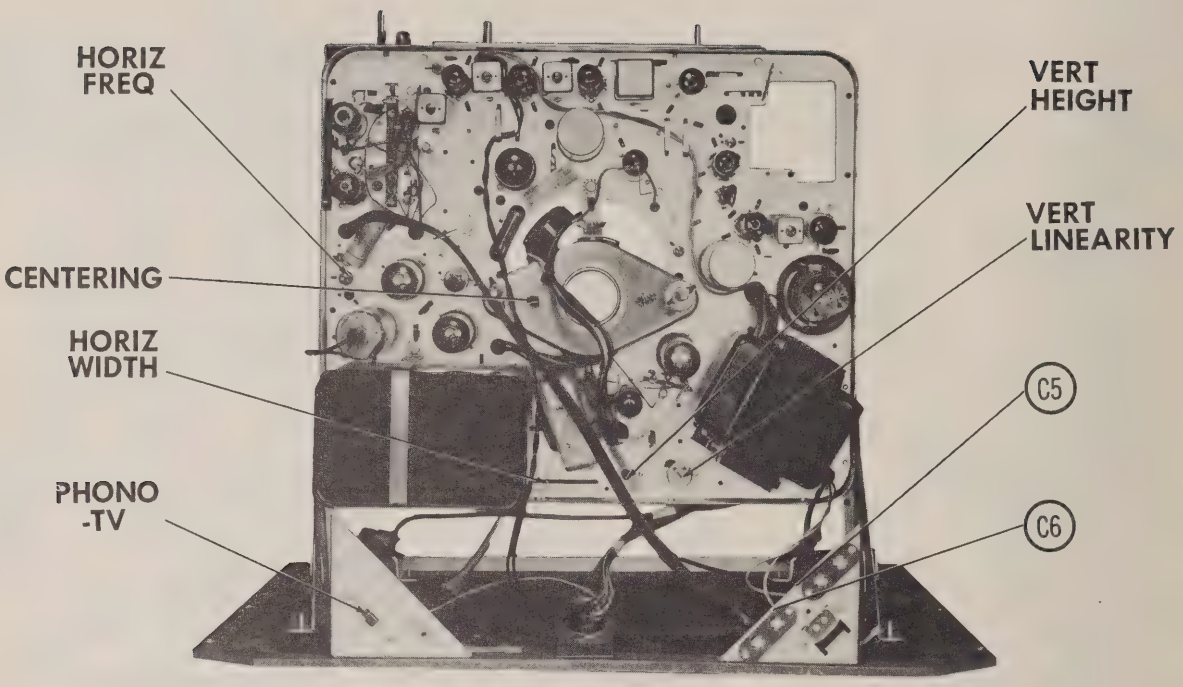


RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE

FOLDER 4



CHASSIS—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the horizontal hold control to the center of its range.

Turn the horizontal frequency slug (B1) slowly clockwise while switching off and on channel until the picture loses sync.

Turn B1 slowly counter clockwise until the picture regains sync, then continue one-half turn in the same direction.

The picture should hold sync at both extreme settings of the horizontal hold control.

If necessary, readjust B1 SLIGHTLY and test for sync pull-in as above.

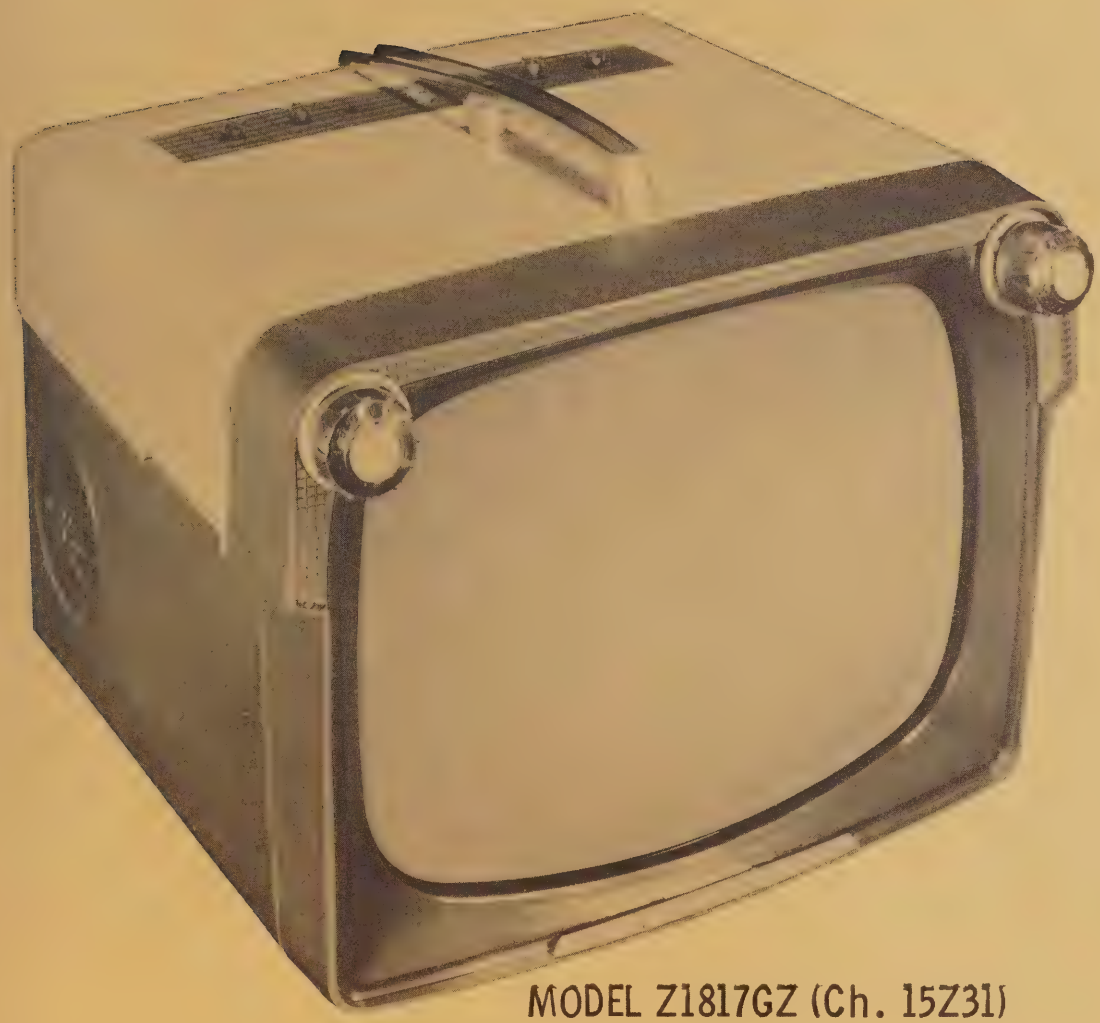
Adjust the width slug (B2) for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally.

PHOTOFACT* Folder

*TRADE MARK

ZENITH MODELS Z1817GZ, GZU, LZ, LZU, Z1819JZ, JZU (Ch. 15Z31, U)

PROPERTY OF
L. E. KNOWLENGHT
DENVER, COLORADO



MODEL Z1817GZ (Ch. 15Z31)

ZENITH MODELS Z1817GZ, GZU, LZ, LZU, Z1819JZ, JZU (Ch. 15Z31, U)

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PHOTOFACT* Folder
*TRADE MARK

ZENITH MODELS Z1817GZ, GZU, LZ, LZU, Z1819JZ, JZU (Ch. 15Z31, U)

PROPERTY OF
DENVER, COLORADO

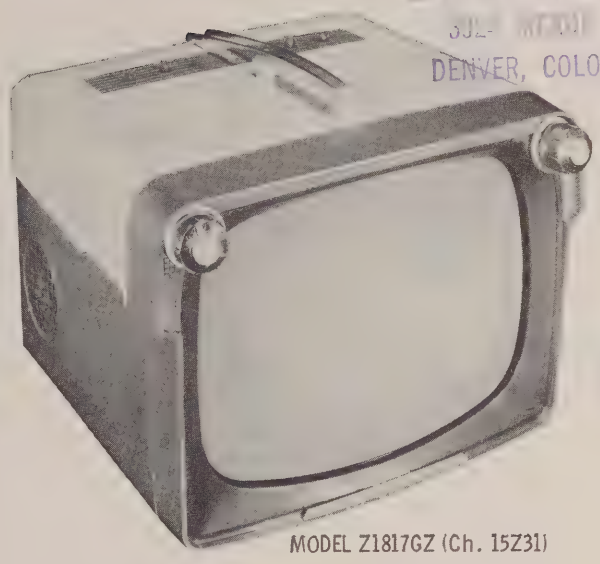
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type control knobs from the top.
2. Remove 8 metal screws and the rear cover.
3. Remove 2 speaker leads.
4. Remove 4 metal screws from the back which hold the upper and lower chassis braces.
5. Remove the chassis from the front of the cabinet.
6. Remove 2 speaker nuts and the speaker.

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.



MODEL Z1817GZ (Ch. 15Z31)

TRADE NAME	Zenith	MODELS	CHASSIS
		Z1817GZ, Z1817LZ, 1819JZ	15Z31
		Z1817GZU, Z1817LZU, Z1819JZU	15Z31U
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois		
TYPE SET	Television Receiver		
TUBES	Fifteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 150 Watts, 1.3 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 push-on type knobs from the front.
Remove 4 metal screws and metal trim.
Remove safety glass.

SPECIAL ADJUSTMENTS

A. AGC

Observe the picture and advance the AGC control to a point where the picture distorts or a buzz is heard in the sound. Back off from this setting until the picture becomes stable with no noise in the sound.

B. Focus

The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 2, or 6 and 10. Readjust the ion trap for the best focus consistent with maximum brightness.

C. Width

The width may be varied by means of a metallic sleeve located between the yoke and the picture tube neck. Adjust sleeve in or out of the yoke for a picture SLIGHTLY larger than necessary to fill the screen.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Turn the set on and tune in a TV station. Set the fine horizontal hold control to the center of its range and adjust the course horizontal hold control until the picture synchronizes horizontally. (For location, see tube placement chart).

SOUND IF DETECTOR ADJUSTMENT

To eliminate audio detector buzz, adjust the buzz control for MINIMUM buzz and maximum sound. (For location,see tube placement chart).

FUSES

One fuse is used for horizontal sweep circuit protection. A 6Ω fusible resistor (R96) is used for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

ZENITH MODELS Z1817GZ, GZU, LZ, LZU, Z1819JZ, JZU (Ch. 15Z31, U)

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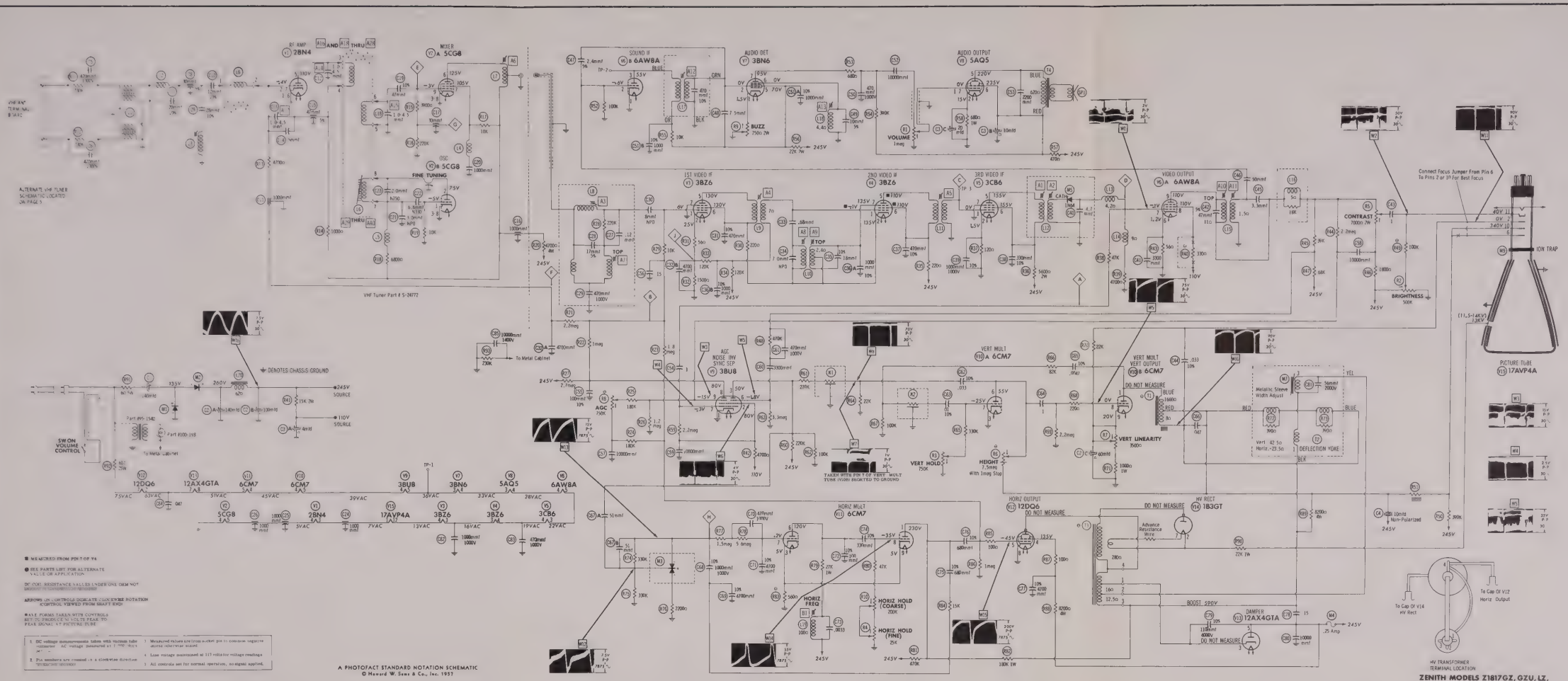
H148

FOLDER 5


RF AMP Y1 2BN4
MIXER Y7 A 5CG8
OSC Y7 B 5CG8
FINE TUNING
VHF TUNER Part # S-24772
SOUND IF Y6 B 6AW8A
AUDIO DET Y7 3BN6
AUDIO OUTPUT Y8 5AQ5
VOLUME
1ST VIDEO IF Y1 3BZ6
2ND VIDEO IF Y4 3BZ6
3RD VIDEO IF Y5 3CB6
VIDEO OUTPUT Y6 A 6AW8A
CONTRAST
BRIGHTNESS
ION TRAP
PICTURE TUBE Y15 17AVP4A
AGC NOISE INV SYNC SEP Y9 3BU8
VERT MULT Y10 A 6CM7
VERT MULT VERT OUTPUT Y10 B 6CM7
VERT LINEARITY
VERT HOLD
HEIGHT
DEFLECTION YOKE
HORIZ MULT Y11 6CM7
HORIZ OUTPUT Y13 12DQ6
HV RECT Y14 1B3GT
DAMPER Y13 12AX4GTA
HORIZ FREQ
HORIZ HOLD (COARSE)
HORIZ HOLD (FINE)
BOOST 590V
DO NOT MEASURE
ON/OFF VOLUME CONTROL
DENOTES CHASSIS GROUND
To Metal Cabinet
245V SOURCE
110V SOURCE
Connect Focus Jumper From Pin 6 To Pins 2 or 19 For Best Focus
To Cap Of V14 HV Rect
To Cap Of V12 Horiz Output
HV TRANSFORMER TERMINAL LOCATION
ALTERNATE VHF TUNER SCHEMATIC LOCATED ON PAGE 3
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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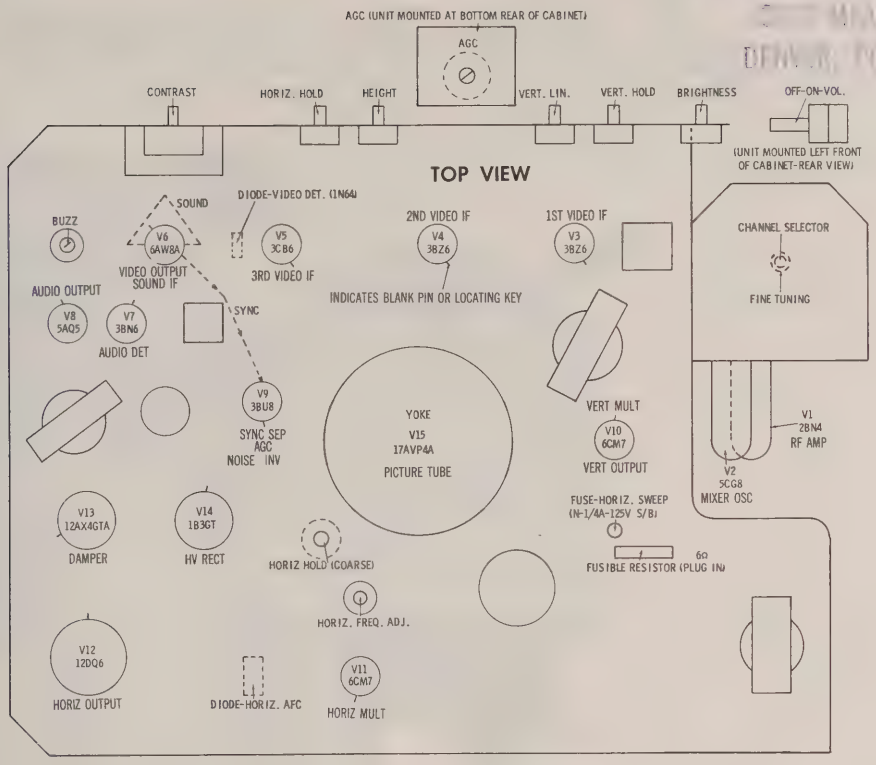
ZENITH MODELS Z1817GZ, GZU, LZ, LZU, Z1819JZ, JZU (Ch. 15Z31, U)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

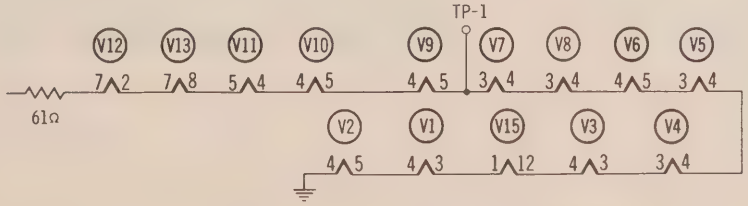
POWER SUPPLY FAILURE
No raster, no sound - **Fusible Resistor (R91), Rectifier (M1, M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, Diode (M5), V6**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V15**
Has pic, no sound - **V6, V7, V8**
Overloaded picture - **V9**

SYNC FAILURE
No vert. sync - **V9**
No horiz. sync - **V9, Diode (M3)**
No vert. or horiz. sync - **V9**

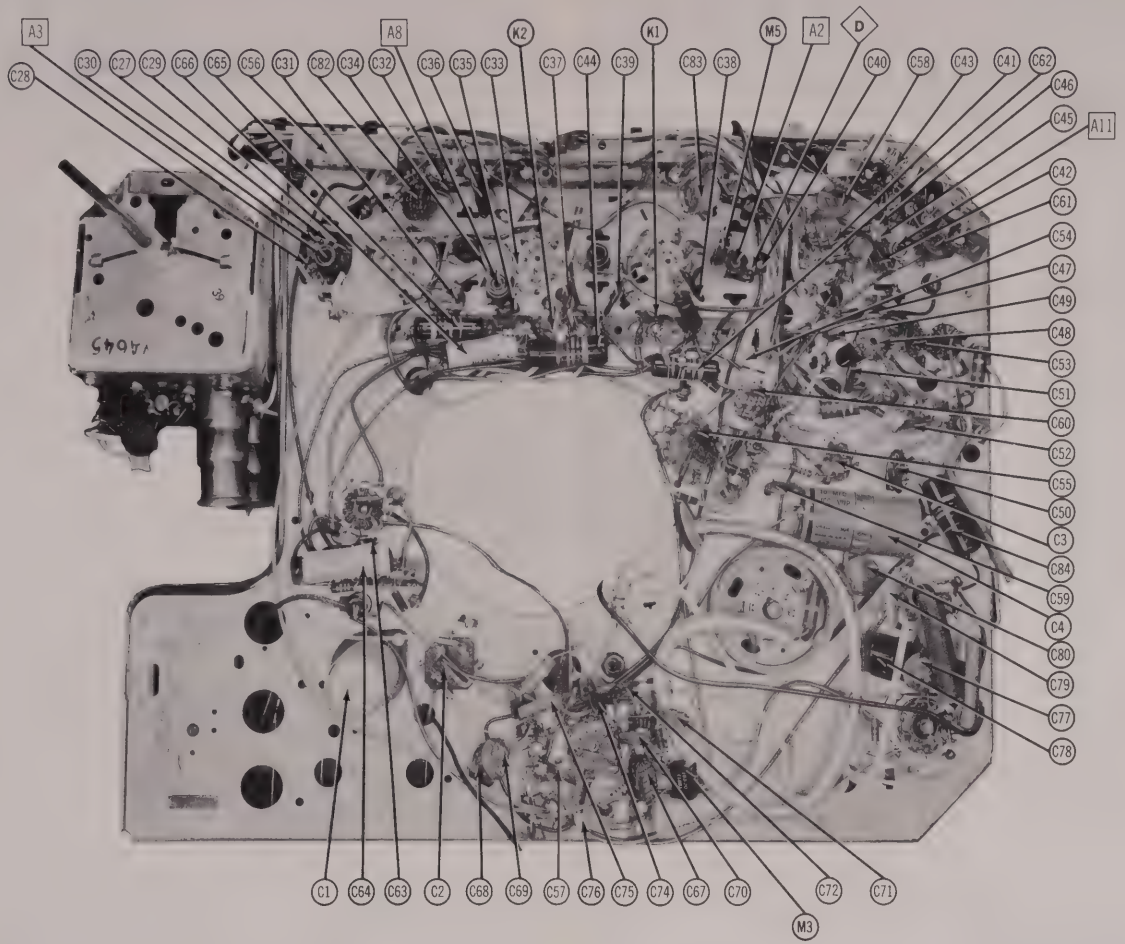
SWEEP FAILURE
No raster, has sound - **M3, V11, V12, V13, V14, V15**
No vertical deflection - **V10**
Poor vert. linearity or foldover - **V10**
Poor horiz. linearity or foldover - **V11, V12, V13**
Narrow picture - **V11, V12, V13, M1, M2**
Vert. off freq. - **V10**
Horiz. off freq. - **V11**

This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below).



ZENITH MODELS Z1817GZ, GZU, LZ, LZU, Z1819JZ, JZU (Ch. 15Z31, U)

FOLDER 5

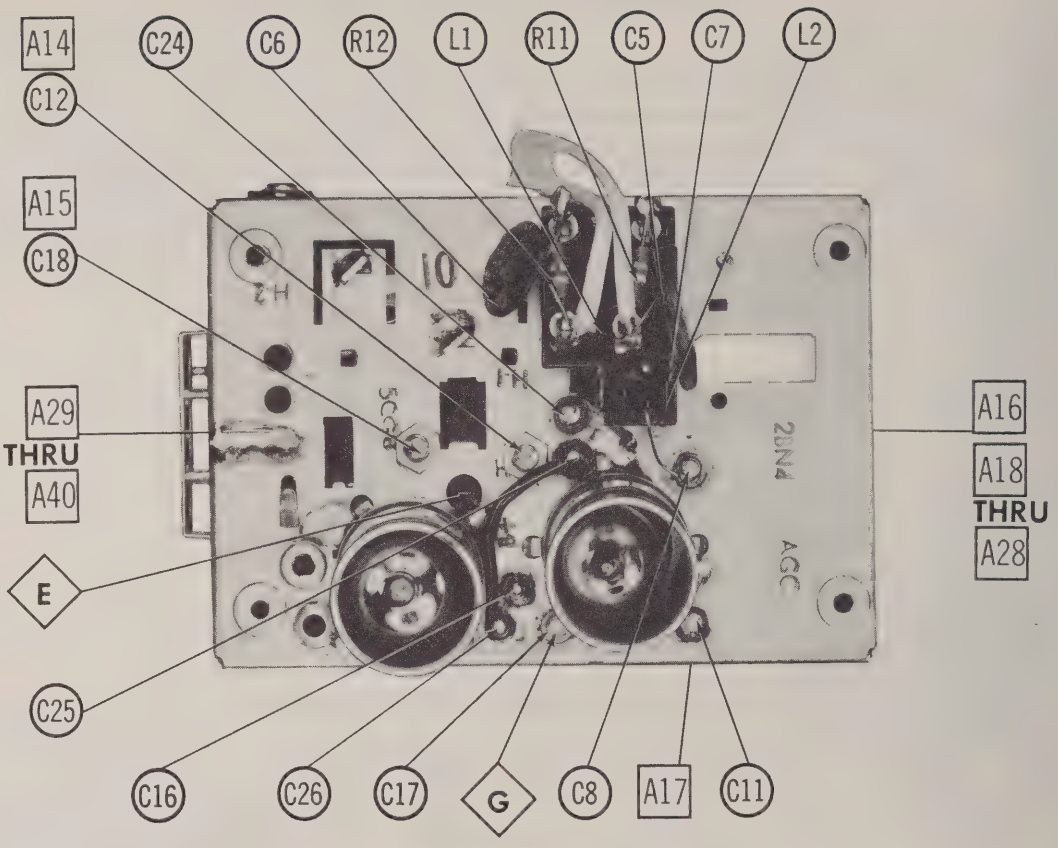


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

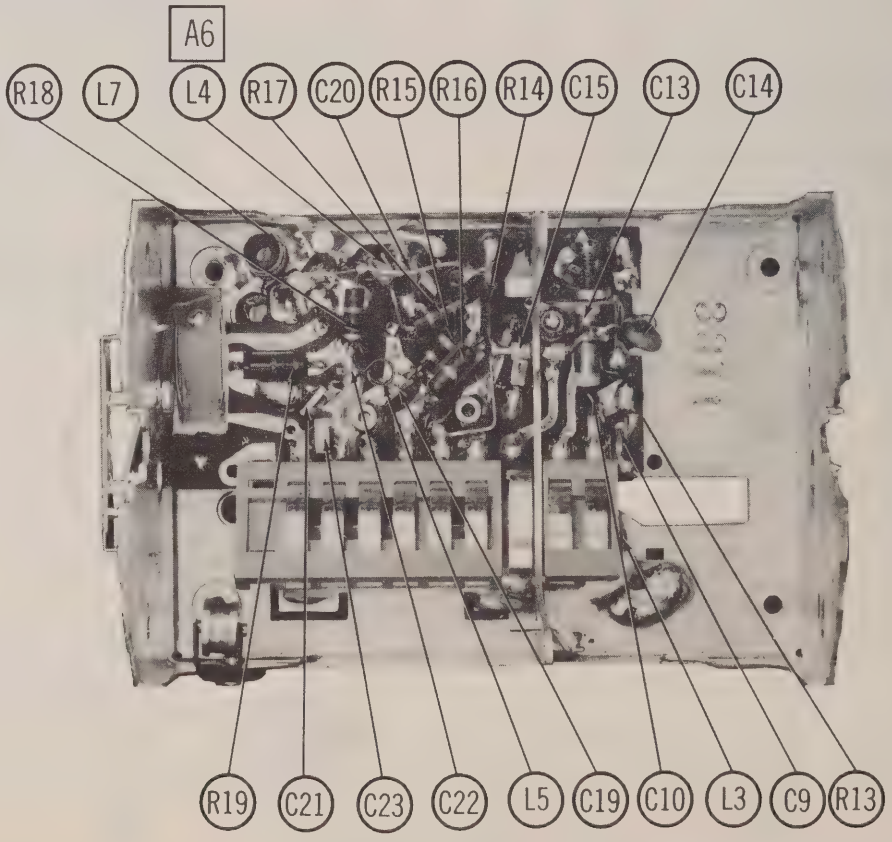
PROPERTY OF
L. F. BLANKENSHIP
3614 MEADE ST.
DENVER, COLORADO

ALTERNATE TUNER SCHEMATIC

A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1957



TUNER-TOP VIEW

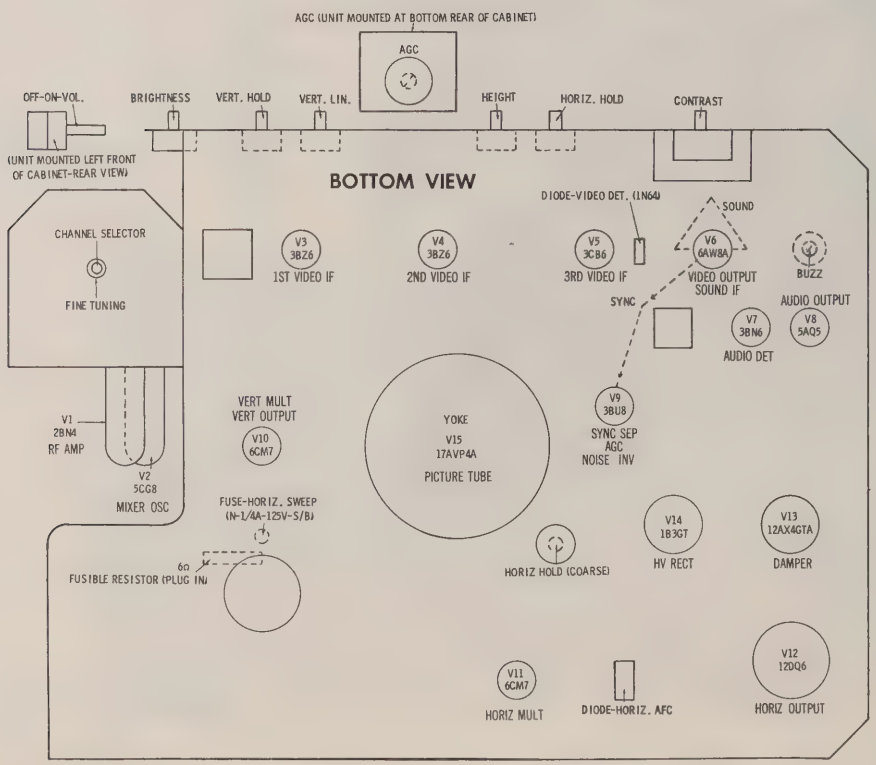


TUNER-BOTTOM VIEW

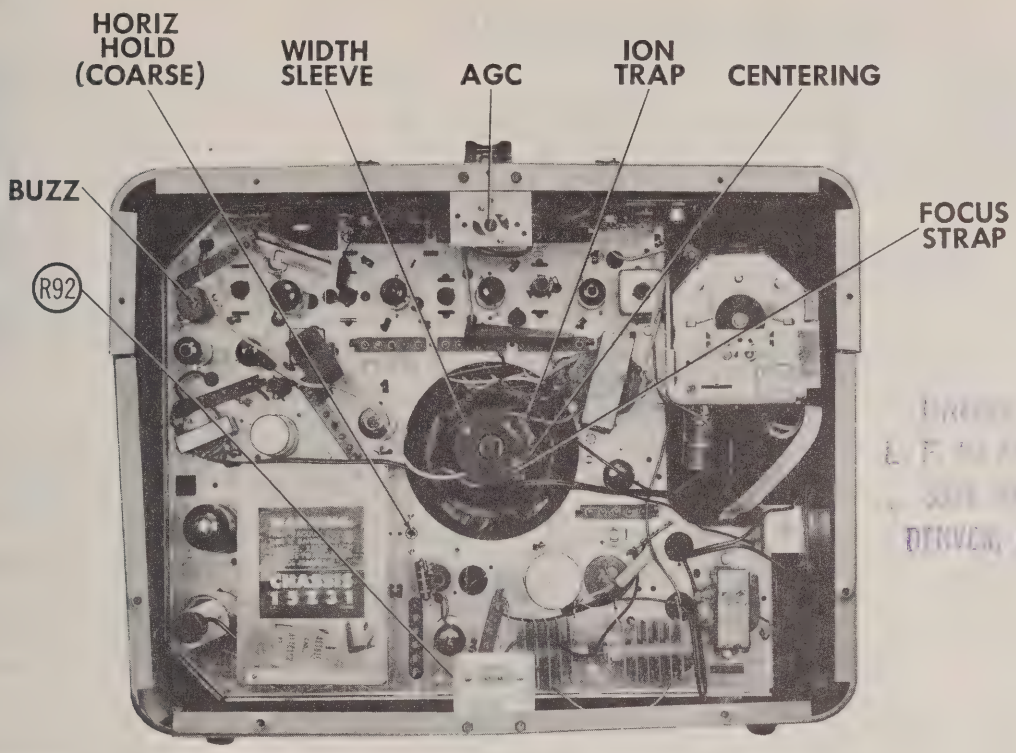
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	2BN4	0Ω	3.5Meg	1.5Ω	1Ω	† 5700Ω	0Ω	3.5Meg		
V2	5CG8	10K	† 12K	0Ω	0Ω	1Ω	† 4700Ω	† 15K	0Ω	220K
V3	3BZ6	1.5Meg	1500Ω	4Ω	3Ω	■ 220Ω	■ 220Ω	0Ω		
V4	3BZ6	60K	INF	4Ω	5Ω	† 280Ω	† 280Ω	INF		
V5	3CB6	.1Ω	120Ω	6Ω	5Ω	† 5600Ω	† 5600Ω	0Ω		
V6	6AW8A	0Ω	100K	† 32K	7.5Ω	6Ω	56Ω	4700Ω	† 15K	† 7800Ω
V7	3BN6	• 180Ω	.4Ω	9.5Ω	8.5Ω	† 22K	4.4Ω	† 390K		
V8	5AQ5	0Ω	680Ω	8.5Ω	7.5Ω	† 1100Ω	† 530Ω	0Ω		
V9	3BU8	0Ω	† 20K	† 60K	10.5Ω	9.5Ω	3.3Meg	† 2.2Meg	† 1.5Meg	420K
V10	6CM7	‡ 10K	TP	0Ω	12Ω	10.5Ω	• ‡ 5.5Meg	• 570K	2.2Meg	• 1300Ω
V11	6CM7	† 300K	NC	560Ω	12Ω	13.5Ω	† 27K	7.8Meg	• 150K	560Ω
V12	12DQ6	TP	16.5Ω	TP	† 8400Ω	450K	TP	19Ω	0Ω	TOP CAP ‡ 16Ω
V13	12AX4GTA	TP	NC	¶	NC	† 62Ω	NC	16.5Ω	13.5Ω	
V14	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡ 296Ω
V15	17AVP4A	1.5Ω	23K	PIN 6 ‡ 480K	PIN 10 ‡ 480K	PIN 11 • 130K	PIN 12 3Ω			

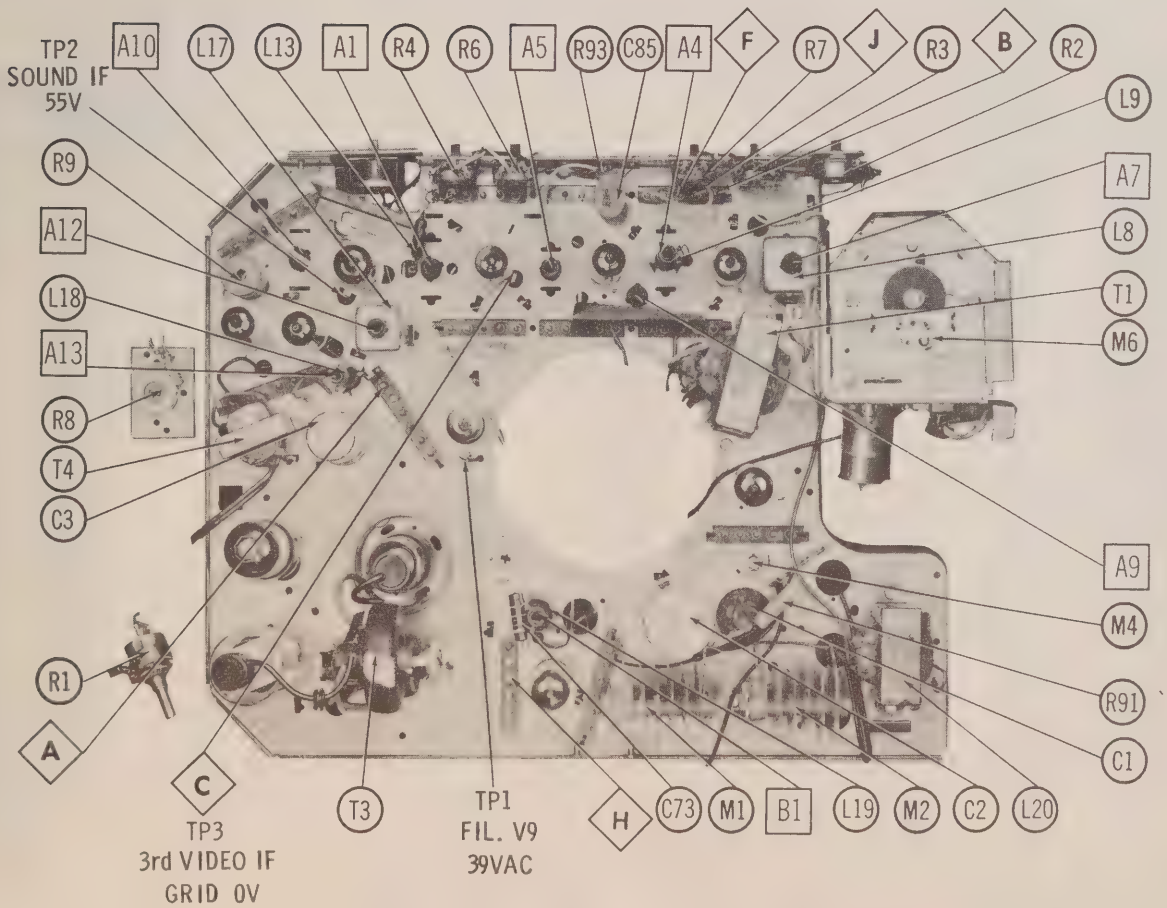
† MEASURED FROM OUTPUT OF M2.
‡ MEASURED FROM PIN 3 OF V13.
■ MEASURED FROM PIN 7 OF V4.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART



CABINET-REAR VIEW



CHASSIS TOP VIEW

UNIVERSITY OF
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	2BN4	
V2	Mixer Oscillator	3USB	
V3	1st Video IF Amp	3DZ8	
V4	2nd Video IF Amp	3DZ8	
V5	3rd Video IF Amp	3CB6	
V6	Video Output-Sound IF Amp	6AW8A	
V7	Audio Det	3BN6	

ITEM No	USE	TYPE	NOTES
V8	Audio Output	5AQ8	
V9	AGC-Noise Inv -Sync Sep.	3DU8	
V10	Vert. Mult.-Vert. Output	6CM7	
V11	Horiz. Mult.	6CM7	
V12	Horiz. Output	12DQ6	
V13	Damper	12AX4GTA	
V14	HV Rectifier	1B3GT	

PICTURE TUBE

ITEM No	REPLACEMENT DATA			NOTES
	ZENITH PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	
V15	17AVP4A	17AVP4A 2 / 17AVP4A 3 / 17ATP4A 1	17AVP4A 2 / 17ATP4A 3 / 17ATP4A 4 / 17ATP24	‡ Aluminized ② Silver screen "B5"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No	PYRAMID PART No	SANGAMO PART No.	SPRAGUE PART No.
C1	40	150	23-3745	AFH31-33	XA038I	FP117	TM8-34		TVL-3438
C2A	40-40	150	23-3741	AFH31-99-R3	CO704.3	FP138.7		eQ-32L 5 / MT-4580	R3300 *
B	80-80	300							
C	450	55							
C3A	44	350	23-3744	AFH3-180	BO630 / BR425	FP331.3 / UTC60	TM7-119	T-510	R3416 *
B	80	450							
C	20	25							
C4	10	400	23-3870 ①	PRS400 / VNP10	BR3045 / BR3045	TC76 / TC76	TD-20-450 / TD-20-450	MT-4520 / MT-4520	R3386 *

* Non-catalog item
† Connect negative leads together
① Non-polarized unit.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	470	1000	23-6	HVD-15-470	DD-47T	BYA10T47	HD15-470	DC30347	5GA-T47	
C6	470	1000	23-6	HVD-15-470	DD-47T	BYA10T47	HD15-470	DC30347	5GA-T47	
C7	130		23-3223	NPO-S1 130	DD-13I	LJ0T13	ED-130		5TCC-T13	10%
C8	36		23-3223							5%
C9	38		23-3230							10%
C10	13		23-3219							10%
C11	1000		23-3213	EF-001		MFT-1000			503C-D1	
C13	1.0-4.5		23-3209			523-B	532-B			
C33	1.0-4.5		23-3209			523-B	532-B			
C14	5		23-3213	S1 5	D5-050	LJ0Q5			5GA-V5	
C35	47		23-3217							5%
C17	1000		23-3213	EF-001		MFT-1000			503C-D1	
C37	30		23-3219							
C18	1.0-4.5		23-3209			523-B	532-B			
C19	47		23-3215							10%
C20	1000		23-3211	BPD-001	DD-10Z	BYA8D1	ED-1000	DC521	5HK-D1	
C21	3.0		23-3214							NP0
C22	5.1		23-3223							N330
C23	3.0		23-3210							N750
C34	1000		23-3213	EF-001		MFT-1000			503C-D1	
C25	1000		23-3213	EF-001		MFT-1000			503C-D1	
C26	1000		23-3213	EF-001		MFT-1000			503C-D1	
C27	18		23-3243							
C38	17		23-3294							5%
C39	470	1000	23-6	HVD-15-470		BYA10T47	HD15-470	DC30347	5GA-T47	10%
C30	8		23-2481							NP0
C31	470		23-16		D6-47I	LJ0T47	ED-470			10%
C33A	4700		23-34	BPD-4X0047	BYC5D047	ED-0047 / ED-0047	UC-5247 / UC-5247	5HK-D47		
B	4700					ED-0047				
C33	68		23-1766		TCZ-R68	TCO-68				
C34	7.0		23-3213			C3DYZC				NP0
C35	18		23-2960		D6-18D	LJ0Q18	TCO-18 / ED-1000 / ED-1000			10%
C38A	1000		23-21							10%
B	1000									10%
C37	470		23-16		D6-47I	LJ0T47	ED-470			10%
C38	330		23-2867	1469-00033		5R5T33			M8-333	5%
C39	1000	1000	23-17							10%
C40	4.7		23-2967	NPO-S1 4.7	TCZ-4R7	CTA8V47C	TCO-4.7	Z7-5547	5TCCB-Y47	
C41	3300		23-21	BPD-0033	DD-332	BYA10D33	ED-0033	UC-5333	5GA-D33	
C42	47		23-3467	NPO-S1 47	TCZ-47	CD4C7C	TCO-47	Z7-5447	5TCC-Q47	5%
C43	.1	300	23-1777	P288N-1		DF-104	CUB2P1	GEM-201	2TM-P1	
C44	.033	500	23-3468							10%
C45	3.3		23-3243	NPO-S1 3.3	TCZ-3R3	CTA8V33C	TCO-3.3	Z7-5533	5TCCB-Y33	
C46	2.2		23-2462	NPO-S1 2.2	TCZ-2R2	LJ7G2	TCO-2.2	Z7-5422		
C47	2.4		23-2596							5%
C48	7.5		23-2742							
C49	15		23-3781	NPO-S1 15	TCZ-15	C16QJC	TCO-15	Z7-541	5TCC-Q1	5%
C50	470	1000	23-6	HVD-15-470	DD-47I	BYA10T47	HD15-470	DC30347	5GA-T47	
C51A	1000		23-21				ED-1000 / ED-1000			10%
B	1000									10%
C52	3000		23-3	BPD-01	DD-103	BYA8D1	ED-01	DC511	5HK-S1	
C53	2200		23-8	BPD-0022	DD-223	BYA10D22	ED-0022	UC-5223	5GA-D22	
C54	1	300	23-1777	P288N-1		DF-104	CUB2P1	GEM-201	2TM-P1	
C55	100		23-21	BPD-Q1 100	DD-101	LJ0Q1	ED-100	Z7-533	5TCC-Y1	10%
C56	.15	200	23-1247	P288N-15			CUB2P15	GEM-2015	2TM-P15	
C57	10000		23-3	BPD-01		BYA8S1	ED-01	DC511	5HK-S1	
C58	10000		23-3	BPD-01	DD-103	BYA8S1	ED-01	DC511	5HK-S1	
C59	10000		23-3	BPD-01	DD-103	BYA8S1	ED-01	DC511	5HK-S1	
C60	3300		23-11	BPD-0033	DD-332	BYA10D33	ED-0033	UC-5233	5GA-D33	
C61	470	1000	23-6	HVD-15-470	DD-47I	BYA10T47	HD15-470	DC30347	5GA-T47	
C62	.033	600	23-2825							10%
C63	.01	600	23-2565					GEM-161		10%
C64	.1	400	23-3061	P486N-1		DF-104	CUB4P1	GEM-401	4TM-P1	
C65	.0047	600	23-1842							10%
C66	.047	300	23-1778							
C67A	51		23-35	BPD-05	DF-503	CUB4247 / LJ0Q51	ED-51	GEM-417	2TM-S47	
B	51					LJ0Q51	ED-51			
C68	1000	1000	23-17							10%
C69	4700		23-14							10%

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C70	470	1000	23-6	HVD-15-470	DD-47I	BYA10T47	HD15-470	DC30347	5GA-T47	
C71	4700		23-16							10%
C72	100		23-8	NPO-D1 100	DD-10I	LJ0T1	ED-100	Z7-531	5TCC-T1	10%
C73	.0033	400	23-3084	BPD-0033	DD-332	CUB6D33	ED-0033	GEM-6233	6TM-D33	
C74	330		23-3067	1464-00033		5R5T33			M8-333	10%
C75	680		23-3068	1464-00068	D6-68I	1R5T68	ED-680		M8-368	10%
C76	680		23-3259		D6-68I	1R5T68	ED-680		M8-368	10%
C77	4700		23-34							10%
C78	.15	400	23-3281	P488N-15			CUB4P15		GEM-4015	4TM-P15
C79	100	4000	23-3294							10%
C80	10000		23-3	BPD-01	DD-103	BYA8S1	ED-01	DC511	5HK-S1	
C81	56	3000								
C82	1000	1000	23-17							10%
C83	470	1000	23-6	HVD-15-470	DD-47I	BYA10T47	HD15-470	DCD30347	5GA-T47	
C84	.047	600	23-2844	BPD-05	DF-503	CUB5247		GEM-5247	5TM-S47	
C85	10000	1400	23-3255	DAC-27		HVK1681		GEM-1611	B1-S10	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	63-3618	B-69	A47-1Meg-S	Q11-137	U84	Volume
B	Shaft			AK-7	Not Req.	Not Req.	U8-28	
C	Switch			KH-1	SWE-12	Not Req.	U8-28	
R2	500K	½	63-3284	B-6L	Q37-183	PTA5S8		Brightness
R3A	750K	½	63-3262	B-86	A47-750K-S	Q11-136	PTA754L	Vert. Hold
B	Shaft			Not Req.	KH8-3	Not Req.	Not Req.	
R4A	25K	½	63-3695	B-3S	A47-25K-S	Q11-130	TA3S3L	Horiz. Hold (Fine)
B	Shaft			Not Req.	KH8-3	Not Req.	Not Req.	
R5A	7000Ω	1	63-3609	WH-7S2	A63-7500	WPC7500	2T500L	Contrast - Wire wound
B	Shaft			Not Req.	KH8-3	Not Req.	Not Req.	
R6A	7.5Meg	½	63-3263	AB-8S †	A47-7.5Meg -S †	Q11-143 †	PTA383L †	Height with 1Meg stop
B	Shaft			AK-19	RH-3	TQ	Not Req.	
R7A	3500Ω	½	63-3206	AB-9	A47-4000-S	Q11-114	PTA352L	Vert. Lin.
B	Shaft			AK-19	RH-3	TQ	Not Req.	
R8A	750K	½	63-3263			B11-158	PTA754L	AGC - Note 1
B	Shaft					TM3-K1		
R9	250Ω	2	63-3294		3B-800		FL-750	Buzz - Wire wound
R10A	200K	½	63-3697	BK-48	A47-200K-S	B11-199	TA3S4L	Horiz. Hold (Coarse)
B	Shaft			Not Req.	KH8-1/4	TM3-K1	Not Req.	

† Use 1 Meg resistor in series with the right hand terminal.
Note 1. Alternate control (Part #63-3589) may be used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ZENITH PART No.	IRC PART No.	NOTES
R11	220K			BTS-220K	
R12	330K			BTS-330K	
R13	4700Ω			BTS-4700	
R14	1000Ω			BTS-1000	
R15	3900Ω			BTS-3900	
R16	330K			BTS-330K	
R17	10K			BTS-10K	
R18	5800Ω			BTS-5800	
R19	68Ω			BTS-10K	
R20	4700Ω	4	63-3675		
R21	2.2Meg	½	63-1923		
R22	1Meg	½	63-191		
R23	1.8Meg	½	63-1923		
R24	180Ω	½	63-1880		
R25	180K	½	63-1880	BTS-180K	
R26	1.2Meg	½	63-1915	BTS-1.2Meg	
R27	2.7Meg	½	63-1929		
R28	220K	½	63-1883		
R29	10K	½	63-1827		
R30	220Ω	½	63-1756	BTS-220	
R31	56Ω	½	63-1733	BTS-56	
R32	1500Ω	½	63-1792	BTS-1500	
R33	33K	½	63-1879	BTS-330K	
R34	120K	½	63-1873	BTS-120K	
R35	220Ω	½	63-1756	BTS-220	
R36	5600Ω	2	63-3233	BTS-5600	
R37	120Ω	½	63-1747	BTS-120	
R38	47K	½	63-1855	BTS-47K	
R39	4700Ω	½	63-1813	BTS-4700	
R40	330Ω	½		BTS-330	Note 1
R41	15K	2	63-943	BTS-15K	
R42	4700Ω	½	63-1813	BTS-4700	
R43	56Ω	½	63-1733	BTS-56	
R44	2.2Meg	½	63-1925	BTS-2.2Meg	
R45	39K	½	63-1853	BTS-39K	
R46	1800Ω	½	63-1796	BTS-1800	
R47	68K	½	63-1862	BTS-68K	
R48	470K	½	63-1898	BTS-470K	
R49	100K	½	63-1883	BTS-100 K	Note 2
R50	390K	½	63-1894	BTS-390K	
R51	470K	½	63-1898	BTS-470K	
R52	100K	½	63-1883	BTS-100K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ZENITH PART No.	IRC PART No.	NOTES
R53	680Ω		63-1779	BTS-680	
R54	390K		63-1894	BTS-390K	
R55	10K		63-1827	BTS-10K	
R56	22K	3	63-1858	BTS-22K	
R57	470Ω		63-1771	BTS-470	
R58	680Ω	1	63-3290	BTA-680	
R59	2.2Meg		63-1935	BTS-2.2Meg	
R60	220K		63-1853	BTS-220K	
R61	270K		63-1887	BTS-270K	
R62	100K		63-1883	BTS-100K	
R63	3.3Meg		63-1933	BTS-3.3Meg	
R64	22K		63-1841	BTS-22K	
R65	330K		63-1890	BTS-330K	
R66	82K		63-1866	BTS-82K	
R67	100K		63-1869	BTS-100K	
R68	220Ω		63-1755	BTS-220	
R69	2.2Meg		63-1925	BTS-2.2Meg	
R70	82K		63-1841	BTS-82K	
R71	1000Ω	1	63-965	BTA-1000	
R72	390Ω				
R73	390Ω				
R74	330K		63-1890		
R75	330K		63-1890		
R76	2200Ω		63-1799	BTS-2200	
R77	1.5Meg		63-1918		
R78	5.6Meg		63-1943		
R79	27K	1	63-3102	BTA-27K	
R80	47K		63-1855	BTS-47K	
R81	470K		63-1898	BTS-470K	
R82	180K	1	63-3213	BTA-180K	
R83	560Ω		63-1775	BTS-560	Note 3
R84	15K		63-1834	BTS-15K	
R85	100Ω		63-1744	BTS-100	
R86	1Meg		63-181	BTS-1Meg	
R87	100Ω		63-1744	BTS-100	
R88	8200Ω	4	63-3602	PW4-8200	
R89	8200Ω	4	63-3602	PW4-8200	
R90	21K	1	63-1055	BTA-22K	
R91	6Ω	5	63-3544		
R92	6Ω	25	63-3499		
R93	250K			BTS-250K	

Note 1 Not used in some versions.
Note 2. Some versions may use 220K in this application.
Note 3. Some versions may use 910, 8%, in this application.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA ZENITH PART No	Halldorson PART No	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	Vert. Output Alt. Vert. Output	95-1475 / 95-1535	Z180T 1 / Z180T 1	A-2824 1 / A-2824 1	228T1 2 / 237D1 2	V315 / V315	A-8141 2 / A-8141 2	26S75 / 26S75	U9X 2 / U9X 2
T2A	Yoke-Horiz. (13MH)	95-1452 3	DF506	Y90P12/47	MDF-41	DY-13A	DY-13A	Y-92	Y-40
B	(90°) Vert. (36.5MH)		5 6	5 6	5 6	5 6	5 6	5-7	5 6
T3	Horiz. Output	8-40124		HVO-143		X13T *	HO-27L *	FLY-118 *	

1. Cut and tape blanking lead
2. Drill new mounting hole(s).
3. Includes resistance (R78 & R79) and capacitor (C81).
4. Connect horizontal damping network across terminals #3 and #7.
5. Use original yoke damping network, if necessary.
6. Cut and form a piece of .010 gauge fish paper inside the yoke itself and support with an acetate cement to provide an insulation between the width sleeve and the yoke proper.
7. Connect horizontal damping network across #3 and #1.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TELEVISION CHASSIS CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
4		4	4	4	4		
3		3	3	3	3		
2		2	2	2	2		
1		1	1	1	1		
Special Notes		⑤	⑤	⑤	⑤		

⑤ Install 3.3Ω resistor in series with 1B3 filament.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI	IMPEDANCE SEC	REPLACEMENT DATA ZENITH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	10K	3-4Ω	95-1428					6-11X	

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA ZENITH PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	49-812	4A1	

COILS (RF-IF)

ITEM No.	USE	ZENITH PART No.	NOTES
L1	Ant. Trans.	6-40488	
L2	IF Trap Coil	20-857	
L3	IF Trap Coil	6-40497	
L4	Mixer Screen Coil	20-855	
L5	RF Choke	20-855	
L6A	Ant., RF, Mixer Grid, & Osc. Coils	6-40472	Channel 2
B	" " " "	6-40473	Channel 3
C	" " " "	6-40474	Channel 4
D	" " " "	6-40475	Channel 5
E	" " " "	6-40476	Channel 6

ITEM No.	USE	ZENITH PART No.	NOTES
L6F	Ant., RF, Mixer Grid & Osc. Coils	6-40477	Channel 7
G	" " " "	6-40478	Channel 8
H	" " " "	6-40479	Channel 9
I	" " " "	6-40480	Channel 10
J	" " " "	6-40495	Channel 11
K	" " " "	6-40492	Channel 12
L	" " " "	6-40493	Channel 13
L7	Mixer Plate Coil	20-893	

ITEM No.	USE	REPLACEMENT DATA ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L8	1st. Video IF	9-41370				Complete assembly
L9	2nd. Video IF	9-41396	17-4522 *	TV-130 *	9219 *	
L10A	40.5MC Trap	9-41395				
B	47.25MC Trap	9-41394				
L11	3rd. Video IF	9-53993	17-4523 *	TV-130 *	9219 *	
L12	4th. Video IF	9-40394	17-4523 *	TV-130 *	9219 *	
L13	Resonant Choke	9-53444				
L14	Shunt Peaking Coil	9-18015	19-3300	TV-190	6133	335 Microhenries
L15A	4.5MC Trap	9-40818		TV-190		
B	1st. Sound IF					
L16	Series Peaking Coil	9-20880	19-3135 a		6153 a	157 Microhenries, wound on 1EC resistor
L17	2nd. Sound IF	9-53348				
L18	Quadrature Coil	9-19020	30-1005 *	TV-181	1480 *	

* Drill new mounting hole. a Parallel with 1EC resistor

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE @ CURRENT (1000 Cps)	REPLACEMENT DATA ZENITH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L20	180A	62Ω	1.2 HY	95-1536		C-5032 ①	C-3995 ①	C-2327	2SC41	C-83X ①

① Drill new mounting hole.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L19	100Ω		S-22352	19-1578	TV-183	6310		R-103	28H-5	20-40 Millihenries

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ZENITH PART No.	REPLACEMENT DATA
K1	Integrator		87-5	Sprague R-9173
K2	Integrator		87-4	Sprague R-9174

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ZENITH PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	N	1/4A 125V S/B	136-33	62-18	333.250 (N 1/4A 125V S/B)	346008	N 1/4	HC 0 to 3/10

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT (Measured)	ZENITH PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	
M1	.260A	212-14 ①	1236A ①	1N1007 ②	MR300 ①	6S300 ①	300 ①	
M2	.260A	212-14 ①	1236A ①	1N1007 ②	MR300 ①	6S300 ①	300 ①	
M3		103-20 ①	1215 ①③		1T1 ①③			

① Selenium type. ② Germanium type. ③ 2 Required.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ZENITH PART No.	CBS PART No.	SYLVANIA PART No.	
M5	1N64	103-18	1N64	1N64	Video Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M6	Tuner	S-24772	VHF - Ch. 15Z31
	Tuner	S-24773	VHF - Ch. 15Z31U
	Tuner	S-41362	UHF - Ch. 15Z31U
M7	Width Sleeve		
M8	Centering Device	S-22560	
M9	Ion Trap	S-22574	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

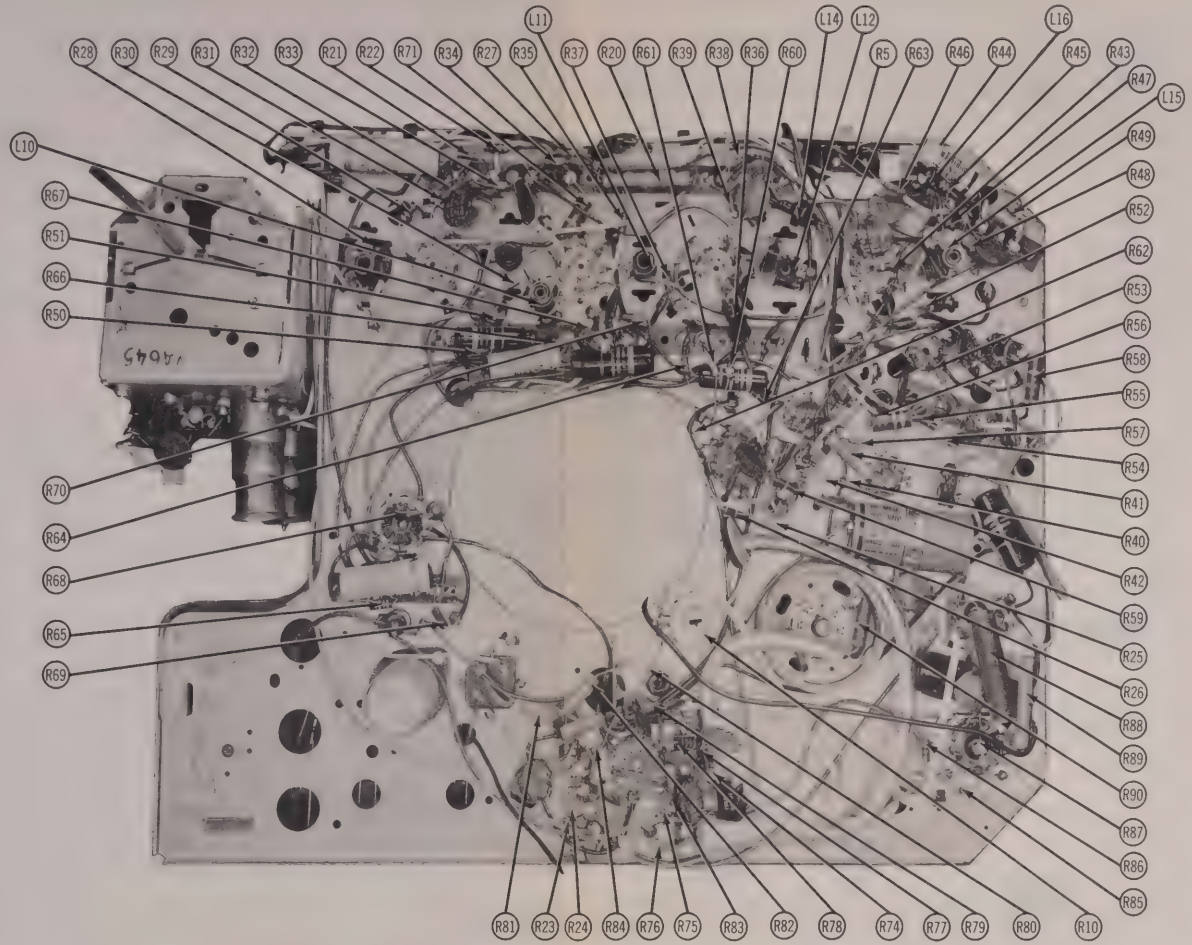
NAME	PART NO.	DESCRIPTION
Safety Glass	192-233	All versions
Mask	57-2307	Models 21817GZ, GZU
Mask	57-2306	Models 21817LZ, LZU
Mask	57-2308	Models 21819JZ, JZU
Knob	46-1788	VHF Channel Selector (Models Z1817GZ, GZU)
Knob	46-1706	VHF Channel Selector (Models Z1817LZ, LZU)
Knob	S-40969	VHF Channel Selector (Models Z1819JZ, JZU)
Knob	46-1743	Fine Tuning
Knob	S-22863	UHF Channel Selector
Knob	S-40911	UHF Dial
Knob	46-1787	Volume (Models Z1817GZ, GZU)
Knob	46-1701	Volume (Models Z1817LZ, LZU, Z1819JZ, JZU)
Knob	S-24847	Horiz. Hold (Models Z1817GZ, GZU)
Knob	S-41057	Horiz. Hold (Models Z1817LZ, LZU, Z1819JZ, JZU)
Knob	S-24847	Vert. Hold (Models Z1817GZ, GZU)
Knob	S-41057	Vert. Hold (Models Z1817LZ, LZU, Z1819JZ, JZU)
Knob	S-24914	Brightness, Contrast (Models Z1817GZ, GZU)
Knob	S-40946	Brightness, Contrast (Models Z1817LZ, LZU, Z1819JZ, JZU)
Cabinet	14-2134	Models Z1817GZ, GZU
Cabinet	14-2133	Models Z1817LZ, LZU
Cabinet	14-2132	Models Z1819JZ, JZU

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Connect a jumper from point Ⓗ to chassis. Connect a short jumper across L19.

Set the horizontal hold control (fine, R4) to the center of its range. Adjust the horizontal hold control (coarse, R10) until the picture is as nearly synchronized as possible.

Remove the jumper from across L19 and adjust the horizontal frequency slug (B1) until the picture is again as nearly synchronized as possible. Remove the jumper from point Ⓗ to chassis and adjust coarse control SLIGHTLY, if necessary to cause positive synchronization when switching off channel and back again.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PHOTOFACT* Folder
*TRADE MARK

AIRLINE
MODELS GTM-1653A, GTM-1654A

AIRLINE
MODELS GTM-1653A, GTM-1654A

AIRLINE
MODELS GTM-1653A, GTM-1654A

TRADE NAME	Airline Models GTM-1653A, GTM-1654A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Illinois
TYPE SET	AC Operated AM Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det. -AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC-60 Cycles
RATING	.29 Amp. @ 117 Volts AC (29 Watts)
TUNING RANGE—BROADCAST	540KC - 1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	200MMF	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1625KC	"	"	A5	"
3.		Loop	1400KC	1400KC	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Check tracking at 600KC. Repeat steps 2 and 3 if necessary.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

AIRLINE
MODEL GTM-1653A

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF Amp.	12AV6	

ITEM No.	USE	TYPE	NOTES
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150	V-14636	PRS150V5050	BBRD5515	WD215	TDLD-9	MTD-1550	TVA-2453
B	50	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	10000		215V304M01	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	N3300
C3	4									
C4	10000	1000			DD-103	BYA10S1				
C5	.047	400		P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C6	.01	400		P488N-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	V-9993-16	AB-60	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			AK-7	FS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AIRLINE PART No.	IRC PART No.	
R2	22K			BTS-22K	
R3	3.3Meg			BTS-3.3Meg	
R4	100Ω			BTS-100	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AIRLINE PART No.	IRC PART No.	
R5	180Ω			BTS-180	
R6	1500Ω	1		BTA-1500	

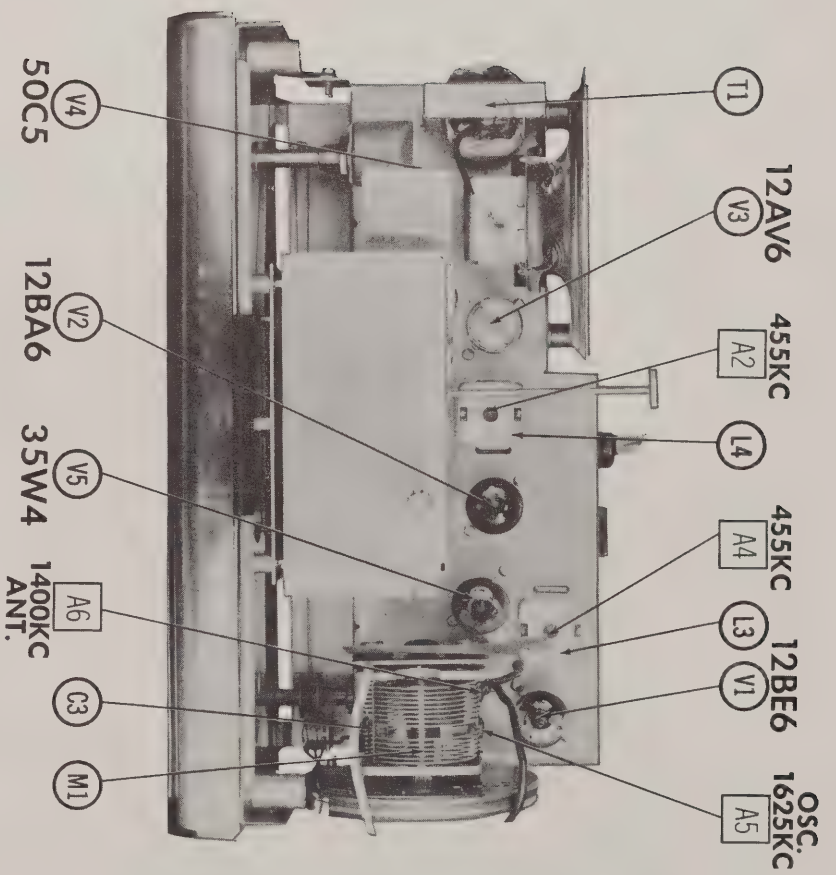
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2300Ω	3-4Ω	V-14645-1	Z1101 ①	A-3025 ①	A-3332 ①	24S53 ①	S-12X ①	① Bend ears down.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	QUAM PART No.	
SP1	3½"	PM	3-4Ω	V-14747-1	3A07	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		AIRLINE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	V-14641-1				
L2	Osc. Coil	V-14639-1 *	14-1073 ①	BC-393 ①	69-OSC②	* Includes R2
L3	Input IF	V-10945-2	16-6758	BC-352	12-C1	
L4	Output IF	V-10945-2				

① Leads sufficient mounting support. ② Drill mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AIRLINE PART No.	REPLACEMENT DATA	
K1	Audio Coup. Net.	5000MMF, 220MMF, 5000MMF, 250MMF, 6.8Meg, 470K, 470K	V-10789-2	Aerovox	PA-113-2
				Centralab	PC-151
				Cornell-Dubilier	116TM2
				Erie	1408-02
				Sprague	DT-2

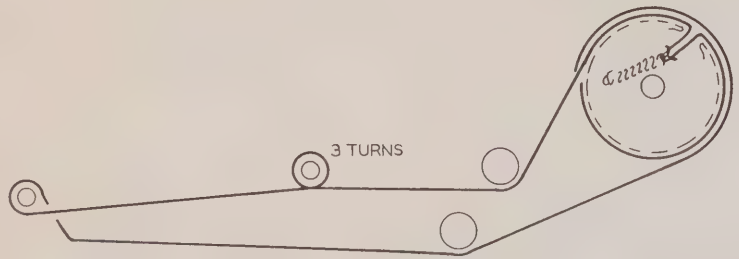
MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M1	Tuning Cap.	V-14637-1	Two Gang (Ant. 10-210MMF, Osc. 16-118MMF)

CABINETS & CABINET PARTS

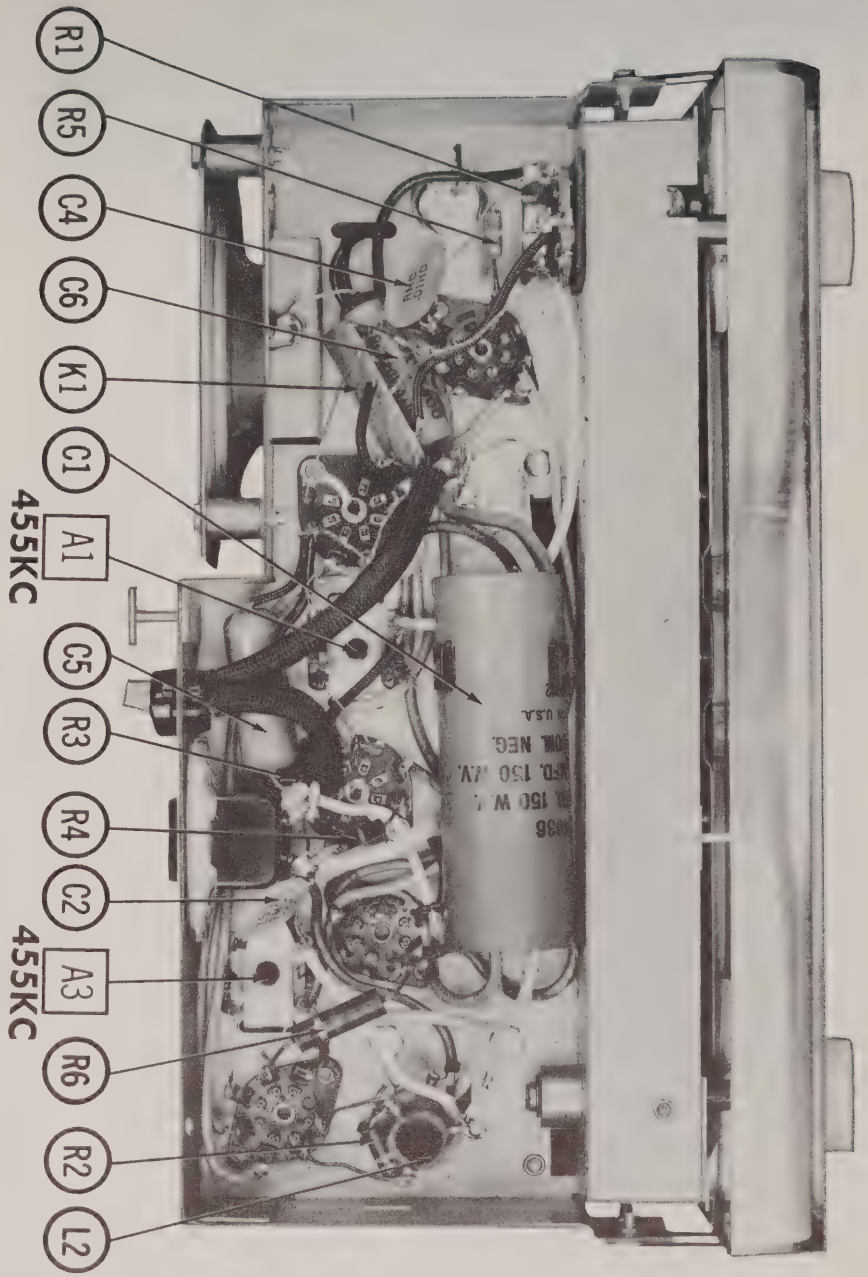
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

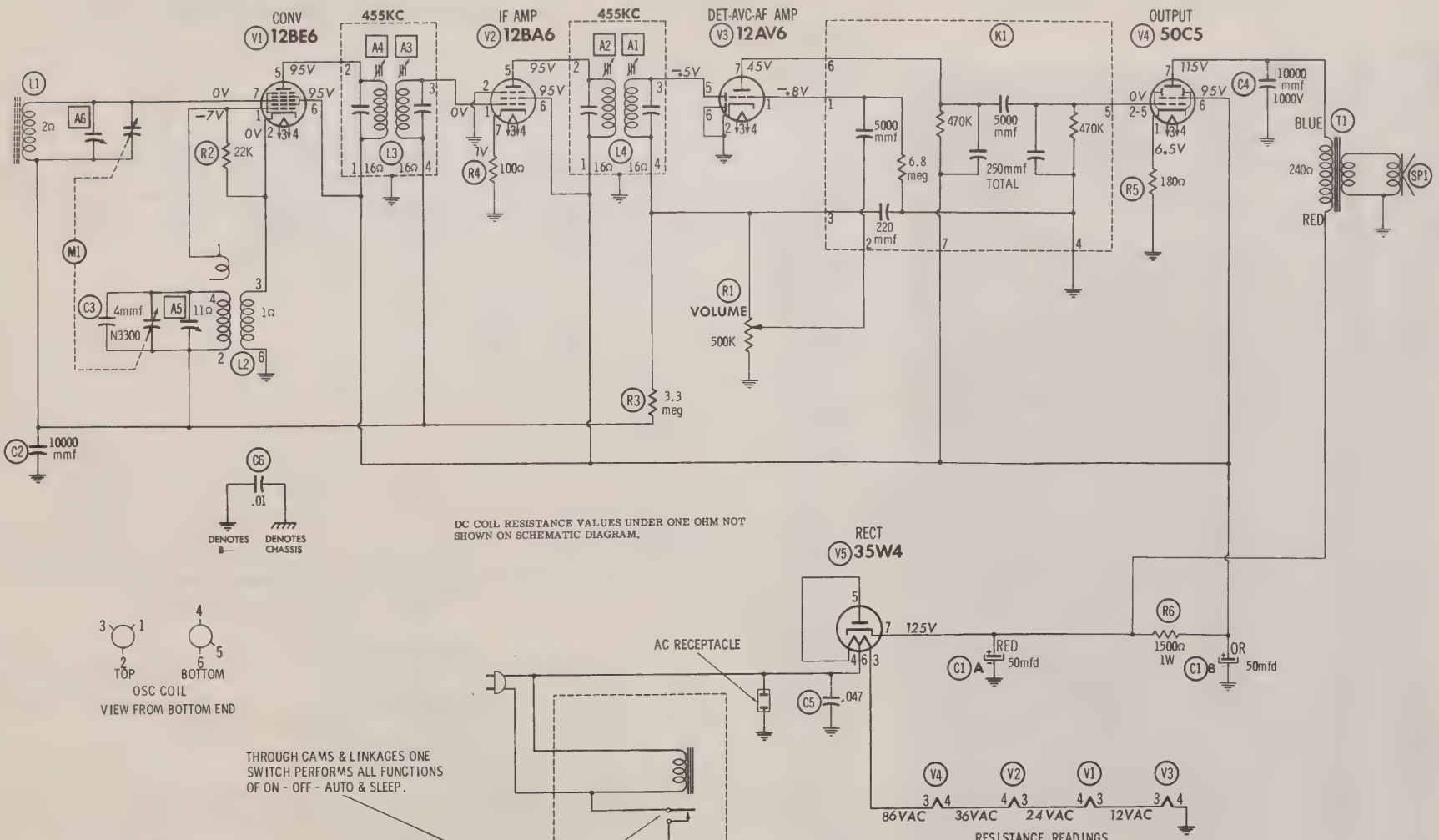
NAME	PART NO.	DESCRIPTION
Knob	V-11573-1	Clock
Knob	550V035M01	Tuning, Volume
Cabinet	513V015M01	(Less Front) White, Model GTM-1653A
Cabinet	513V015M02	(Less Front) Turquoise, Model GTM-1654A
Clock Assembly	659V001M01	Includes Clock Dial
Cabinet Front	558V059M01	Includes Radio Dial
Pointer	558V066M01	Dial



DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW





DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	1Ω	12Ω	24Ω	† 1500Ω	† 1500Ω	3.8Meg
V2	12BA6	3.8Meg	0Ω	24Ω	36Ω	† 1500Ω	† 1500Ω	100Ω
V3	12AV6	6.8Meg	0Ω	12Ω	0Ω	500K	0Ω	† 470K
V4	50C5	180Ω	470K	75Ω	36Ω	470K	† 1500Ω	† 240Ω
V5	35W4	NC	NC	75Ω	115Ω	115Ω	100Ω	20K(Min)

† MEASURED FROM PIN 7 OF V5
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

ARVIN
MODEL 9577 (Ch. 1.41700)

ARVIN
MODEL 9577 (Ch. 1.41700)

ARVIN
MODEL 9577 (Ch. 1.41700)

TRADE NAME	Arvin Model 9577 (Ch. 1.41700)
MANUFACTURER	Arvin Industries, Inc., Columbus, Indiana
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	9 Volts DC
RATING	6.5MA @ 9 Volts DC
TUNING RANGE—BROADCAST	540KC - 1670KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to Antenna Stator Lug on Tuning Gang. Low side to B-	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output.
2.		Loop	1670KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A5	"

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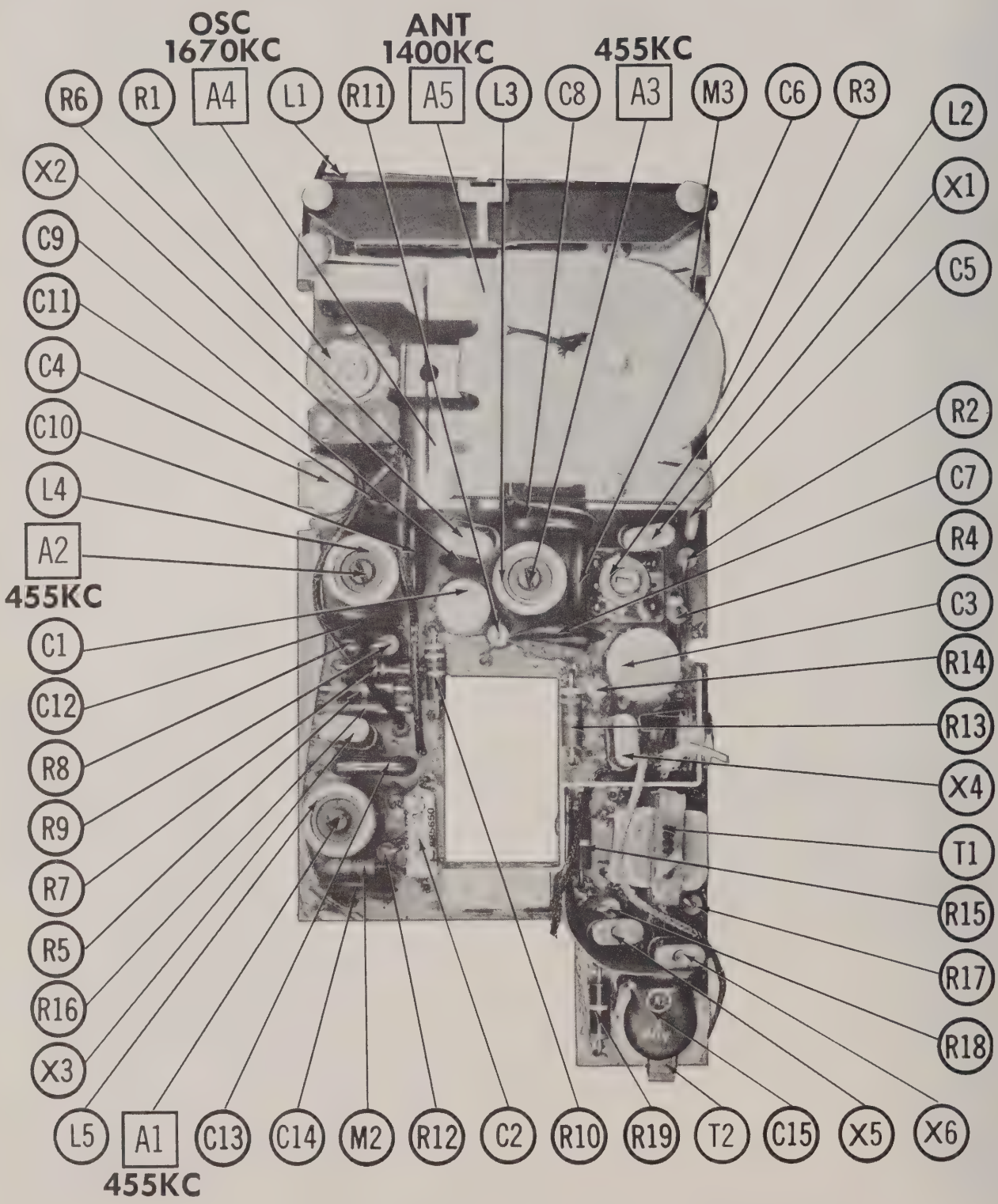


CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N252	Converter			2N94	
X2	2N253	1st. IF Amplifier			2N94A	
X3	2N254	2nd. IF Amplifier			2N34	
X4	2N238	Driver				
X5	2N185	Output				
X6	2N185	Output				

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ARVIN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	10	10	44279-6	XPP10V10	NL10-10	TT12X10	ML10-15		TE-1114
C2	4	10	44396-1	XPP10V4	NL5-15	TT12X5	ML4-15		
C3A	50	10	44397-1 ①		NL50-10				
B	50	10			NL50-10				
C4	50	10	②	XPP10V50	NL50-10	TT10X50			R2305 *

① In some versions C3 may be a dual 80MFD unit (Part #44397-2).
② Some versions may use 80MFD (Part #44279-7).

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	10000				DD-103	BYA6S1	ED-01	DC511	TG-S10	
C6	4700				DD-472	BYA10D47	ED-0047	UC-5247	TG-D50	
C7	50000								TG-S50	
C8	220					L10T22	ED-220	UC-5322	5GA-T22	
C9	6					C10V6C				
C10	220					L10T22	ED-220	UC-5322	5GA-T22	
C11A	20000									
B	20000									
C12A	20000									
B	20000									
C13	330			BPD-00033		L10T33	ED-330	UC-5333	5GA-T33	
C14	20000				DD-203	BYB6S2	ED-02			
C15	100000								TG-P10	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ARVIN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/4	C44384					Volume & Switch (Note 1)

Note 1. Alternate Part #45000-1

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ARVIN PART No.	IRC PART No.	
R2	8200Ω			BTS-8200	
R3	39K 5%			BTS-39K 5%	
R4	3300Ω			BTS-3300	
R5	1000Ω			BTS-1000	
R6	470Ω			BTS-470	
R7	15K 5%			BTS-15K 5%	
R8	2200Ω			BTS-2200	
R9	1000Ω			BTS-1000	
R10	3300Ω			BTS-3300	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ARVIN PART No.	IRC PART No.	
R11	47K 5%			BTS-47K 5%	
R12	220Ω			BTS-220	
R13	4700Ω 5%			BTS-4700 5%	
R14	47K 5%			BTS-47K 5%	
R15	1000Ω			BTS-1000	
R16	220Ω			BTS-220	
R17	5600Ω 5%			BTS-5600 5%	
R18	100Ω 5%			BTS-100 5%	
R19	10Ω			BTS-10	

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	Turns Ratio		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ARVIN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1:	1	44391	GH112 ①②			TR-2 ⑫	T-33X ①	① Cut off mounting tabs. ② Tape center tap on primary.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ARVIN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	1230Ω	17Ω	44390						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ARVIN PART No.	QUAM PART No.	
SP1	2 3/4"	PM	17Ω	44280		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		ARVIN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	44511-1			2005	
L2	Osc. Coil	44383-1				
L3	1st. IF	44386				
L4	2nd. IF	44388				
L5	3rd. IF	44389				

BATTERIES

ITEM No.	VOLTAGE	ARVIN PART No.	REPLACEMENT DATA								NOTES
			BURGESS		EVEREADY		MALLORY		RAY-O-VAC		
			"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V			P6		226		M-1600		1600	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ARVIN PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N295		1N60	1N34A	Audio Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M3	Tuning Cap.	44293	2 Gang (Ant. 15-135MMF, Osc. 18-95MMF)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

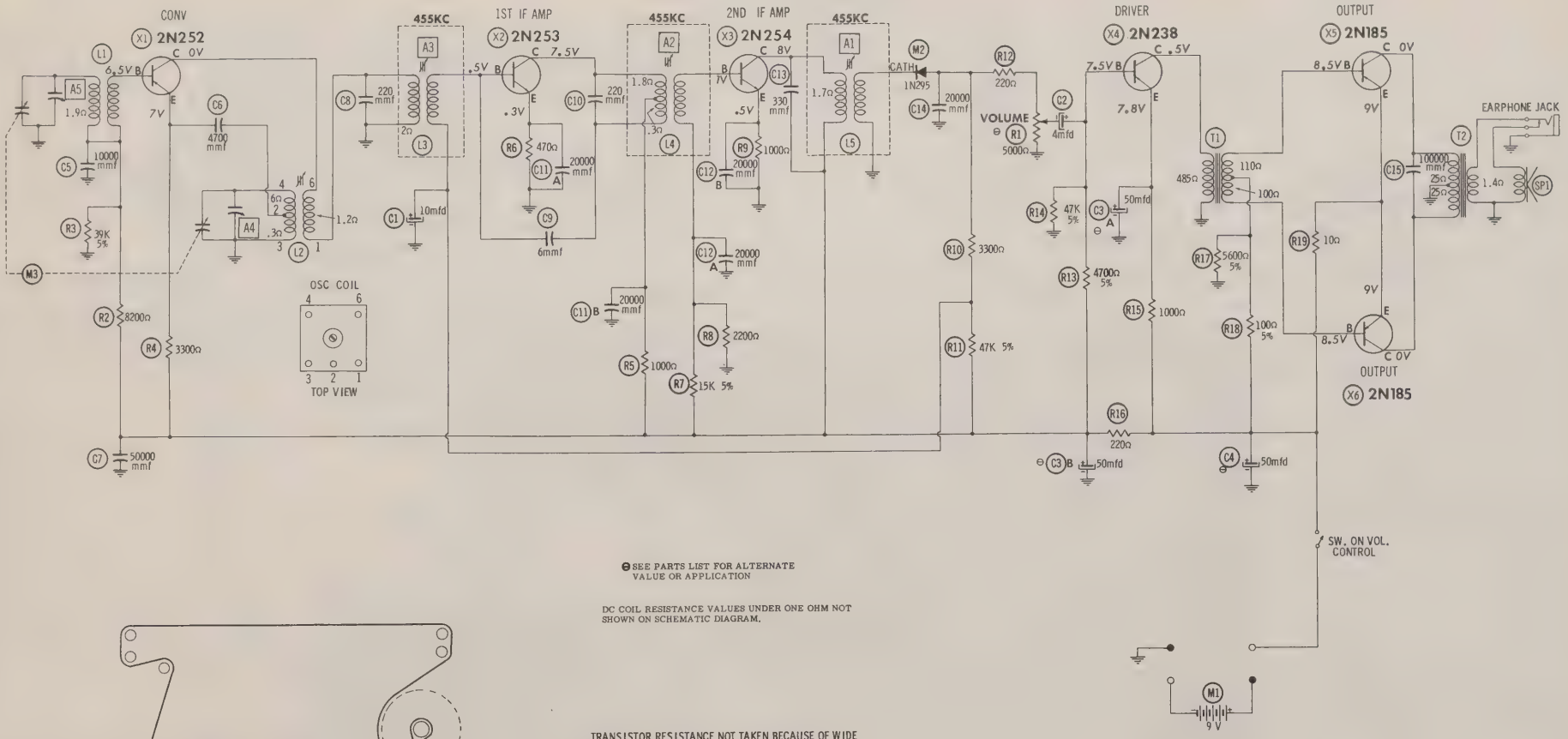
NAME	PART NO.	DESCRIPTION
Knob	44425-29	Tuning, Ebony
Knob	44425-53	Tuning, Pink
Knob	44425-57	Tuning, White
Knob	44555-29	On-Off-Volume, Ebony
Knob	44555-53	On-Off-Volume, Pink
Knob	44555-57	On-Off-Volume, White
Cabinet	44493-29	Ebony
Cabinet	44493-53	Pink
Cabinet	44493-57	White
Pointer	44577	
Earphone Jack	44548	

ARVIN MODEL 9577 (Ch. L 41700)

SET 376 FOLDER 7

FOLDER 7

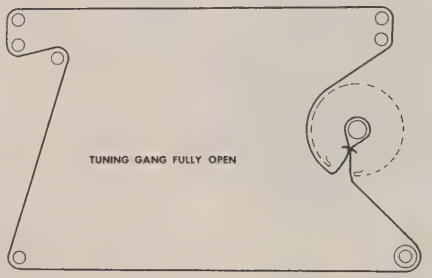
ARVIN MODEL 9577 (Ch. L 41700)



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

TRANSISTOR RESISTANCE NOT TAKEN BECAUSE OF WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE



DIAL CORD STRINGING

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal aplied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

BULOVA
MODEL 260 Series

BULOVA
MODEL 260 Series

BULOVA
MODEL 260 Series

TRADE NAME	Bulova Model 260 Series
MANUFACTURER	Electronics Guild, Inc., Sunrise Highway, Valley Stream, Long Island, N. Y.
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	9 Volts DC
RATING	5.5MA @ 9 Volts DC
TUNING RANGE—BROADCAST	540KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in the same relative position to chassis as when the receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to Antenna Stator Lug on tuning gang. Low side to B-	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output.
2.		Loop	1640KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A5	"

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PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N172	Converter				
X2	2N146	1st. IF Amplifier				
X3	2N146	2nd. IF Amplifier				
X4	310	Driver		2N132		
X5	2N185	Output		2N131		
X6	2N185	Output		2N131		

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	BULOVA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	10	5		XPP6V10	NL10-6	TT6X10	ML10-6	MMT-0210	TE-1087
C2	2	10		XPP10V2	BBR2-50	TT12X2	ML2-15		R2441 *
C3	50	15		XPP15V50	BBR50-15				16D7 *
C4	100	15		SRE15V100	BBR100-15				16D8 *

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	BULOVA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	10000									
C6	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C7	10000									
C8	20000			BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C9	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C10	20000			BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C11	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C12	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C13	2000			BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C14	.047	200		BPD-05	DF-503	CUB2S47		GEM-2147	2TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	BULOVA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2500Ω	1/4						Volume

RESISTORS

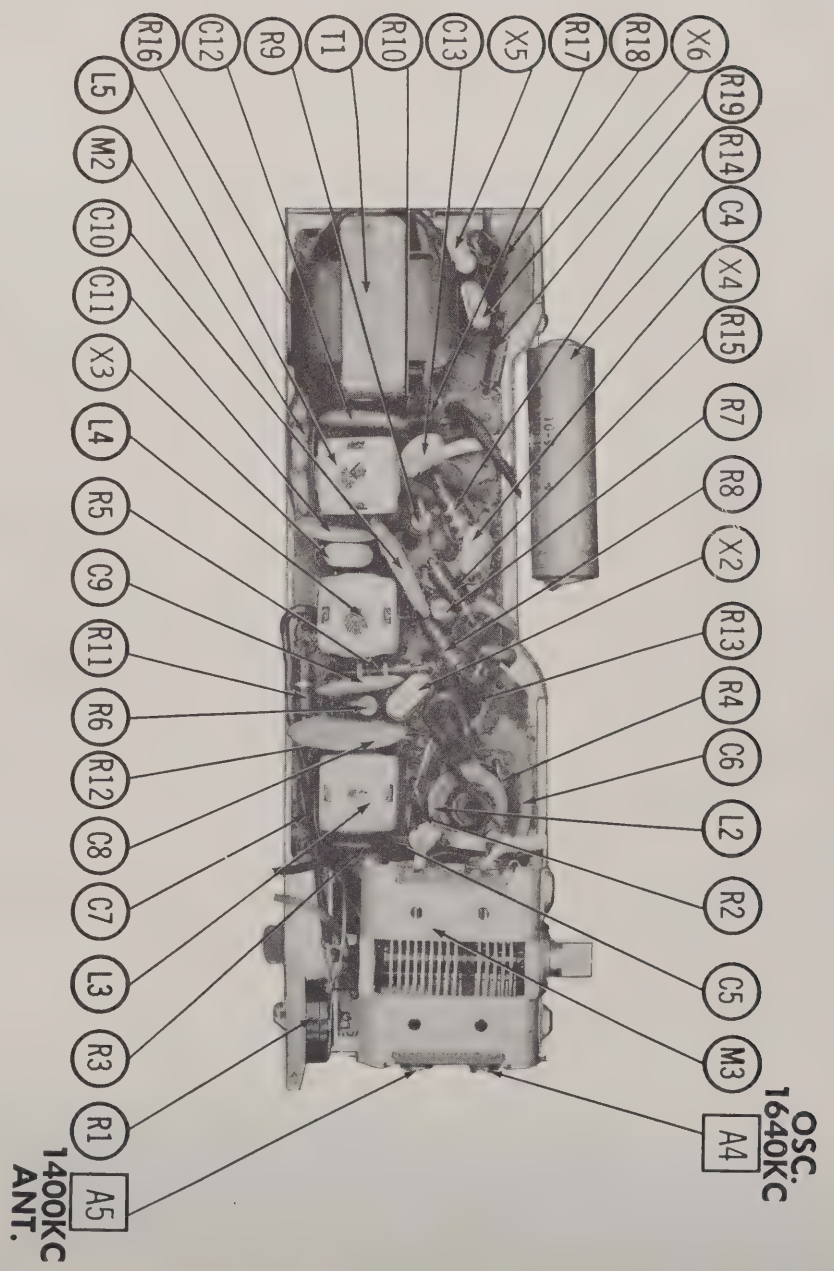
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	BULOVA PART No.	IRC PART No.	
R2	100K			BTS-100K	
R3	470Ω			BTS-470	
R4	2200Ω			BTS-2200	
R5	4700Ω			BTS-4700	
R6	390Ω			BTS-390	
R7	47K			BTS-47K	
R8	6800Ω			BTS-6800	
R9	470Ω			BTS-470	
R10	220Ω			BTS-220	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	BULOVA PART No.	IRC PART No.	
R11	2200Ω			BTS-2200	
R12	100K			BTS-100K	
R13	6800Ω			BTS-6800	
R14	33K			BTS-33K	
R15	1000Ω			BTS-1000	
R16	68Ω			BTS-68	
R17	4700Ω			BTS-4700	
R18	15Ω			BTS-15	Note 1
R19	220Ω			BTS-220	

Note 1. Some versions may use 10Ω.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	Turns Ratio		REPLACEMENT DATA						NOTES
	PRI.	SEC.	BULOVA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.5:	1	24-11	GH117 ①		TA-5 ①	TR-7 ①	TY-56X①	① Fabricate mounting.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	BULOVA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	675Ω CT	3-4Ω	7829-1	GH6 ①				TY-45X①	① Fabricate mounting.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	BULOVA PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	26-8	4A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		BULOVA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick			BC-419		
L2	Osc. Coil					
L3	1st. IF Trans.	24-12				
L4	2nd. IF Trans.	24-12				
L5	3rd. IF Trans.	24-13				

BATTERIES

ITEM No.	VOLTAGE	BULOVA PART No.	REPLACEMENT DATA								NOTES
			BURGESS		EVEREADY		MALLORY		RAY-O-VAC		
			"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V			M6		266					

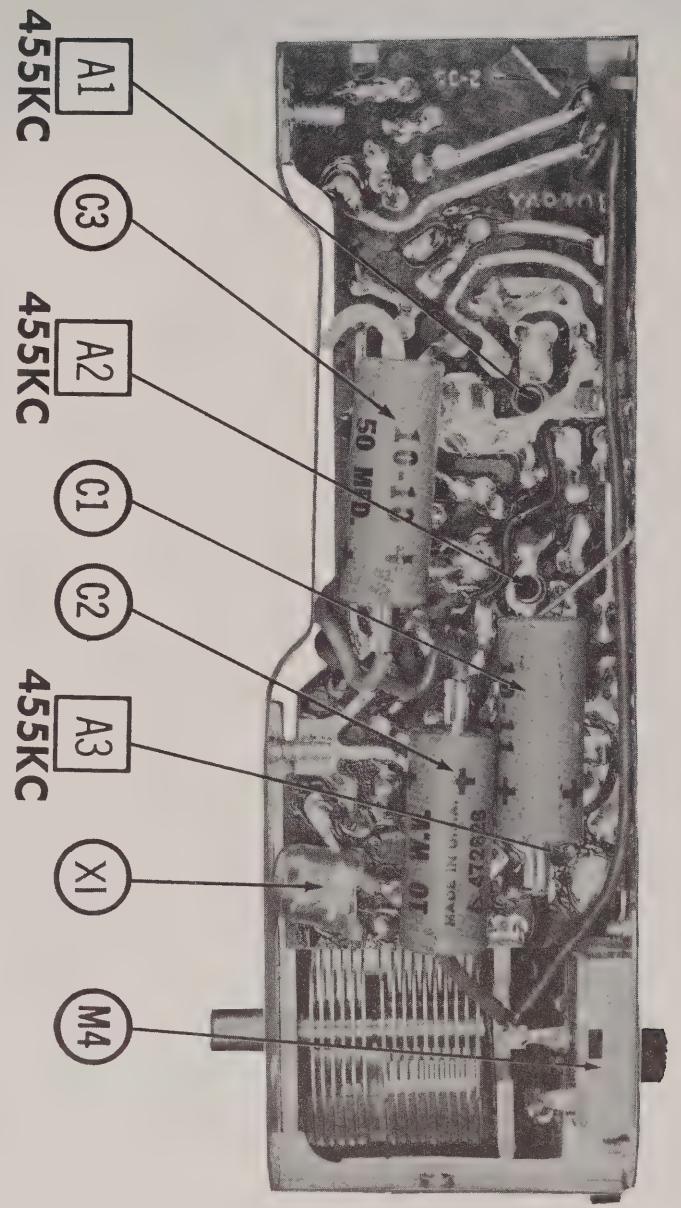
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		BULOVA PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N295		1N60	1N34A	Audio Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	BULOVA PART No.	NOTES
M3	Tuning Cap.		2 Gang (Ant. 20-245MMF, Osc. 21-120MMF)
M4	Switch		On-Off (Slide Type - SPST)

CHASSIS—BOTTOM VIEW

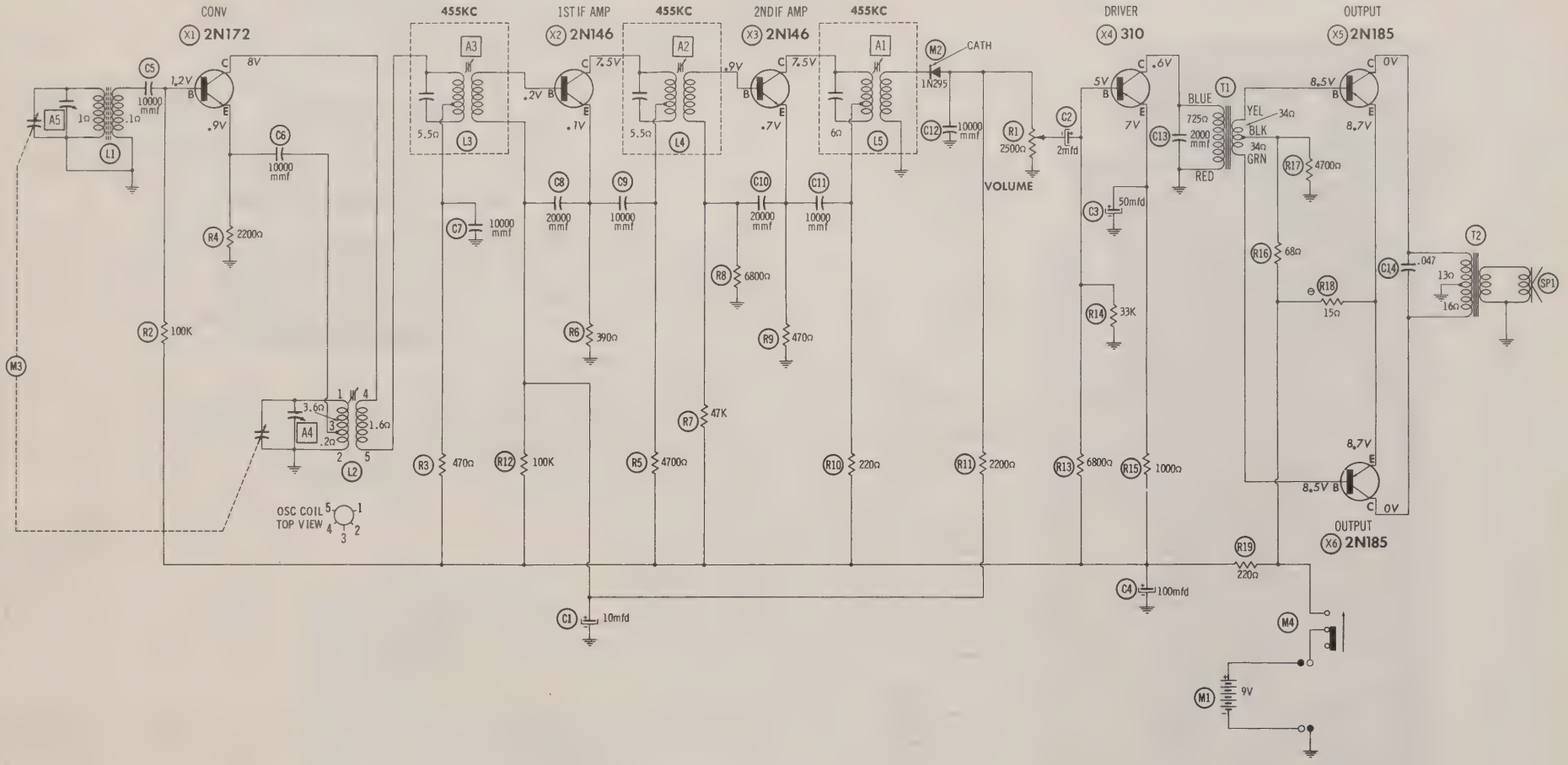


SET 376 FOLDER 8

FOLDER 8

BULOVA MODEL 280

BULOVA MODEL 280



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal applied for voltage measurements.

TRANSISTOR RESISTANCE NOT TAKEN BECAUSE OF WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

PHOTOFACT* Folder
*TRADE MARK
RETMA MEMBER

COLUMBIA RECORDS MODELS 517, 518

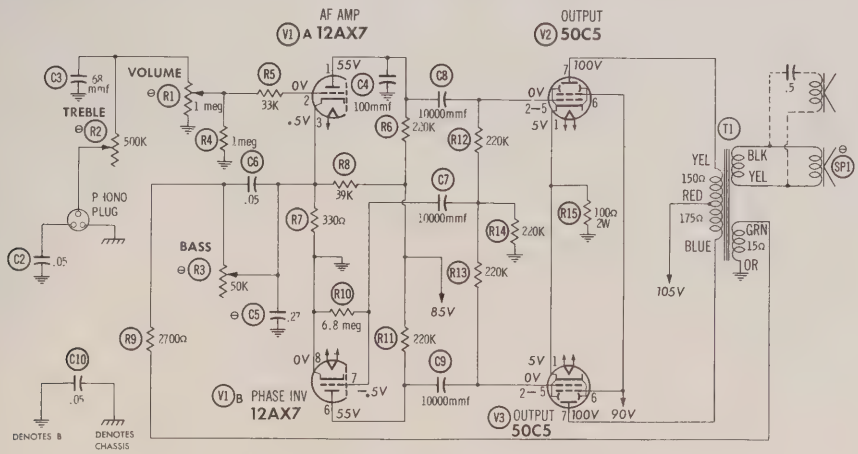
COLUMBIA RECORDS
MODELS 517, 518

PROPERTY OF
L. F. SAMMONS
DENVER, COLORADO

COLUMBIA RECORDS
MODELS 517, 518

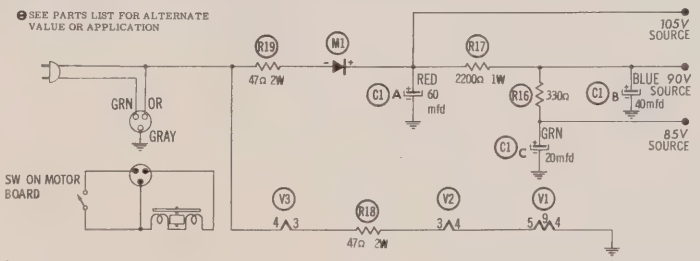
TRADE NAME	Columbia Records Models 517, 518
MANUFACTURER	Columbia Records, 799 Seventh Ave., New York 19, N.Y.
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Three)	Types 12AX7 AF Amp. - Phase Inv., (2) 50C5 Output
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING .35 Amp. @ 117 Volts AC (30 Watts)

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR V-M MODEL 1200A — PHOTOFACT SET 353 FOLDER 16



Pin No.	V1	V2	V3
1	†225K	100Ω	100Ω
2	30K	440K	440K
3	330Ω	70Ω	100Ω
4	0Ω	13Ω	115Ω
5	13Ω	440K	440K
6	†225K	†2200Ω	†2200Ω
7	6.8Meg	†150Ω	†175Ω
8	0Ω		
9	6Ω		

† MEASURED FROM OUTPUT OF M1.



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Howard W. Sams & Co., Inc. 1957

376-9

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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G873

FOLDER 9

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. - Phase Inv.	12AX7	
V2	Output	50C5	

ITEM No.	USE	TYPE	NOTES
V3	Output	50C5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Columbia Records PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	60	150	11B713	AFH3-12	BBRT84215	TCT3117	TDLT-7	FMT-339	TVA-3455
B	40	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Columbia Records PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	400		BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C3	68	500		SI68	D6-680	5W5Q68	ED-68	UC-5468	1FM-468	
C4	100			SI100	D6-101	L10T1	ED-100	UC-531	5GA-T1	
C5	.27	200		P288N-25		CUB2P25		GEM-4025	2TM-P25	Note 1
C6	.05	400		BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C7	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C8	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C9	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C10	.05	400		BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	

Note 1. Some versions may use .25 MFD in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES	
	RESISTANCE	WATTS	Columbia Records PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.		
R1A	1Meg	½	9B548	B-70	A47-1Meg-Z	Q13-137	U53	Volume	Note 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.		
R2A	500K	½	9B546	B-59	A47-500K-S	Q11-133	U50	Treble	Note 2
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.		
R3A	50K	½	9B547	B-31	A47-50K-S	Q11-123	U35	Bass	Note 3
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.		

Note #1. Part #9B549 Used In Model 518.
Note #2. Part #9B550 Used In Model 518.
Note #3. Part #9B551 Used In Model 518.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

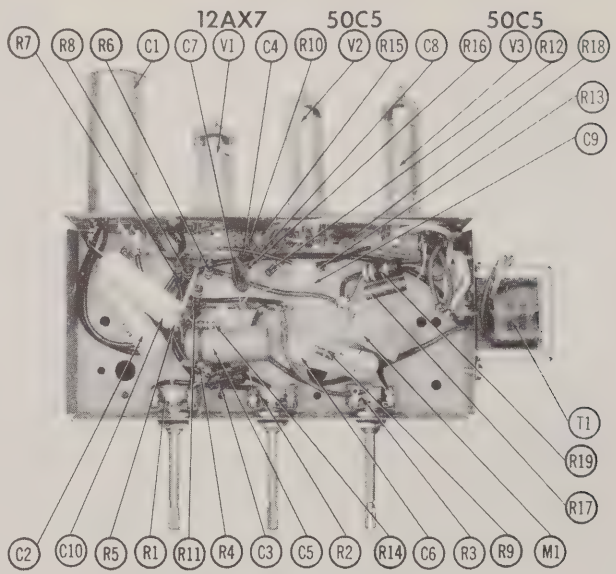
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Columbia Records PART No.	IRC PART No.	
R4	1Meg			BTS-1Meg	
R5	33K			BTS-33K	
R6	220K			BTS-220K	
R7	330Ω			BTS-330	
R8	39K			BTS-39K	
R9	2700Ω			BTS-2700	
R10	6.8Meg			BTS-6.8Meg	
R11	220K			BTS-220K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Columbia Records PART No.	IRC PART No.	
R12	220K			BTS-220K	
R13	220K			BTS-220K	
R14	220K			BTS-220K	
R15	100Ω	2		BTB-100Ω	
R16	3300Ω			BTS-3300	
R17	2200Ω	1		BTA-2200	
R18	47Ω	2		BTB-47	
R19	47Ω	2		BTB-47	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC. 1	Columbia Records PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4200Ω CT	3-4Ω	3B212						
	Trans Ratio PRI. 13:	SEC. 2 1							

CHASSIS—BOTTOM VIEW



SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Columbia Records PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω	1B108 ①	6A21	① Used in Model 517.
	8"			1B111 ②		② Used in Model 518.
	3 1/2"			1B112 ②		

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	Columbia Records PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	
M1	.078	10B604	1005A	RS150	6S150	150	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	Columbia Records PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M2	TO-400-0V			56	PT-1	

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	Columbia Records PART No.	JENSEN PART No.	WALCO PART No.	
M3		† CRA55 or ♦ CRA55D and † CRA55LP or ♦ CRA55LPD	† W-64S and † W-64MGS	† Jewel ♦ Diamond

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

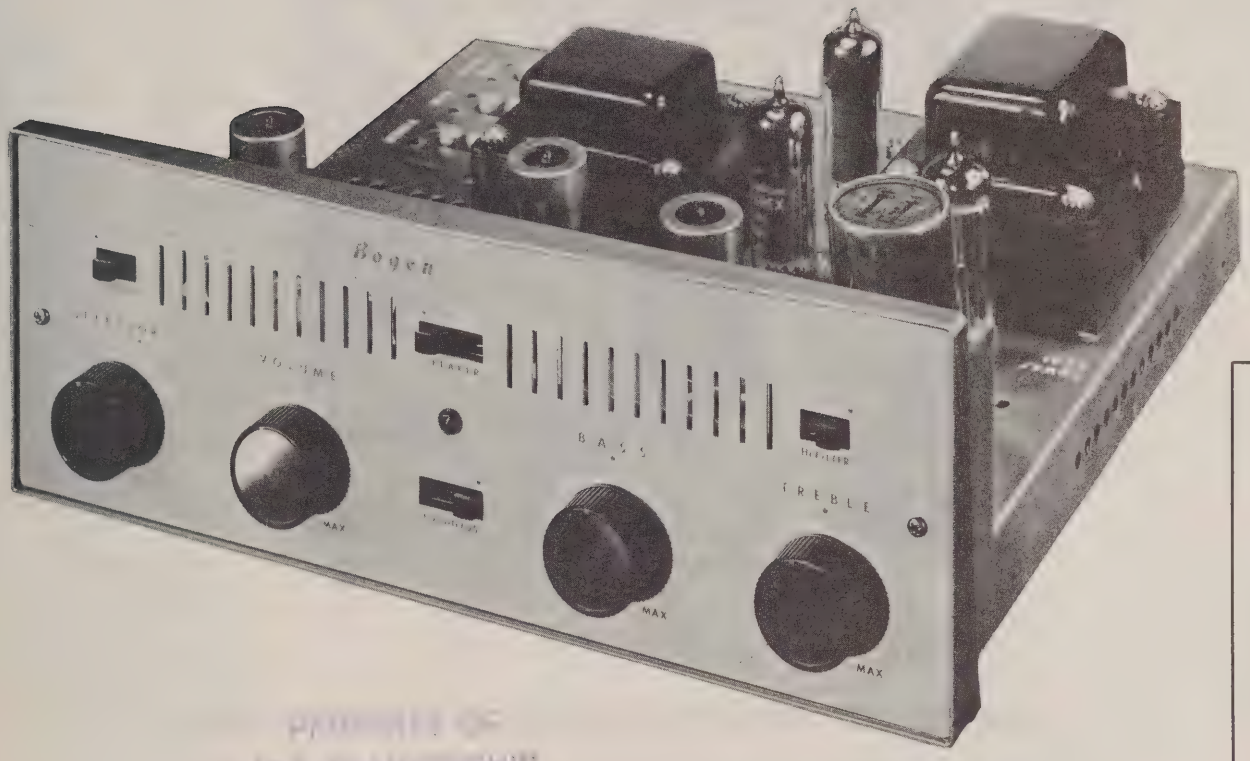
PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER RADIO-ELECTRONICS-TELEVISION MANUFACTURERS ASSOCIATION

DAVID BOGEN MODEL DB115

DAVID BOGEN MODEL DB115



DAVID BOGEN MODEL DB115

TRADE NAME	Bogen Model DB115
MANUFACTURER	David Bogen Co., Inc., 29 Ninth Ave., New York 14, N. Y.
TYPE SET	AC Operated 6 Channel Audio Amplifier
TUBES (Six)	Types ECC83/12AX7 1st AF Amplifier, ECC83/12AX7 (or) ECC82/12AU7 2nd AF Amplifier, 6U8 AF Amp. - Phase Inv., (2) EL84 Output, EZ81/6CA4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .75 Amp. @ 117 Volts AC (77 Watts)

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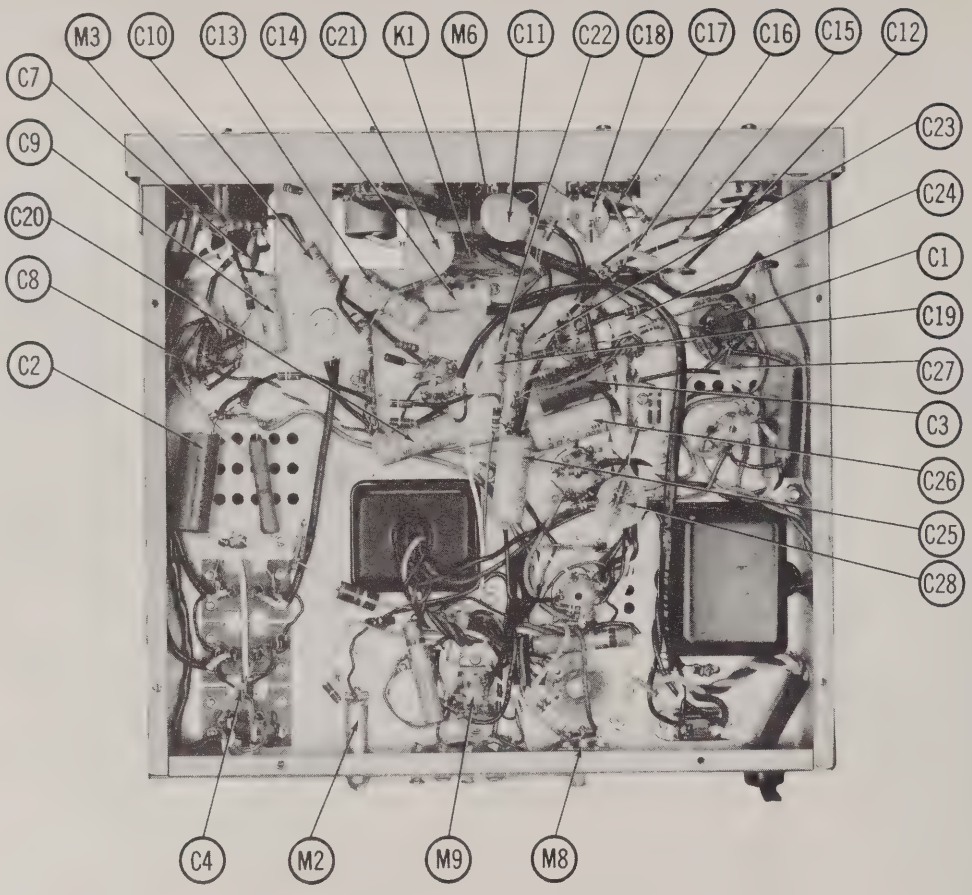
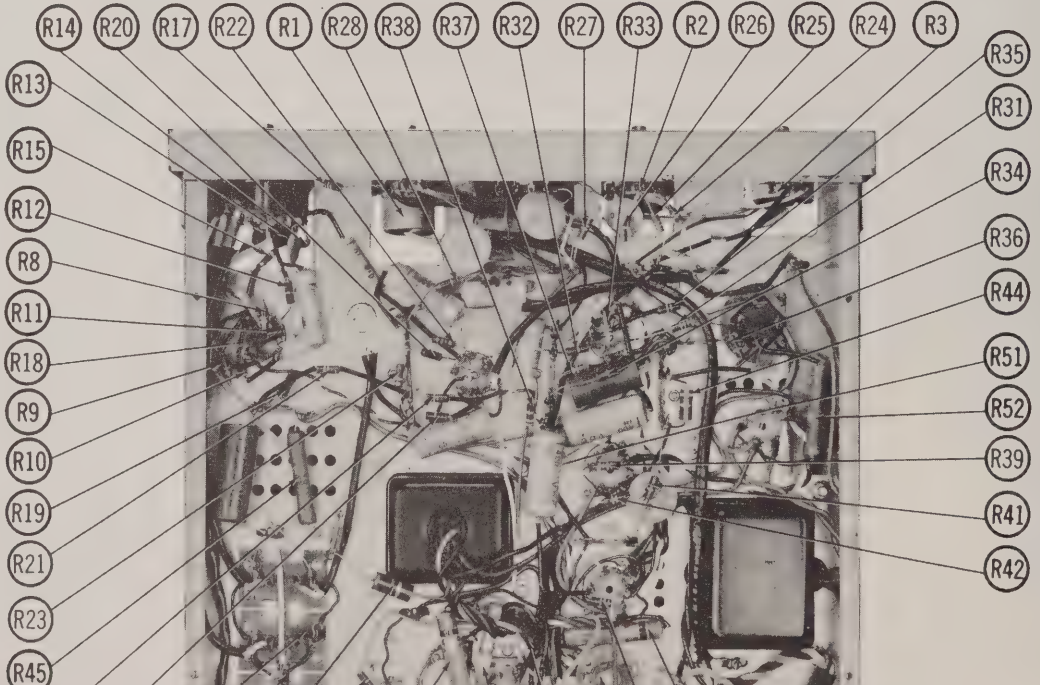
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1957 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st AF Amplifier	ECC83/ 12AX7	
V2	2nd AF Amplifier	ECC83/ 12AX7	Note 1
V3	AF Amp. - Phase Inv.	6U8	
V4	Output	EL84	
V5	Output	EL84	
V6	Rectifier	EZ81/6CA4	

Note 1. Type ECC82/12AU7 used in some versions.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA David Bogen PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲20	500		AFH4-113-80	C0992	FP437			R2454 *
B	■20	400			BR2050	TC83			
C	▲20	300							
D	100	25	(Note 1)						
C2	8	250		PRS250V8	BBR8-250	TC51	TD-8-250	MT-2508	TVA-1503
C3	100	6		PRS6V100	BBR100-6	TC2501	TD-100-6	MTH-0610	TVA-1101

Note 1. In some versions C1D is 20MFD. * Non Catalog Item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

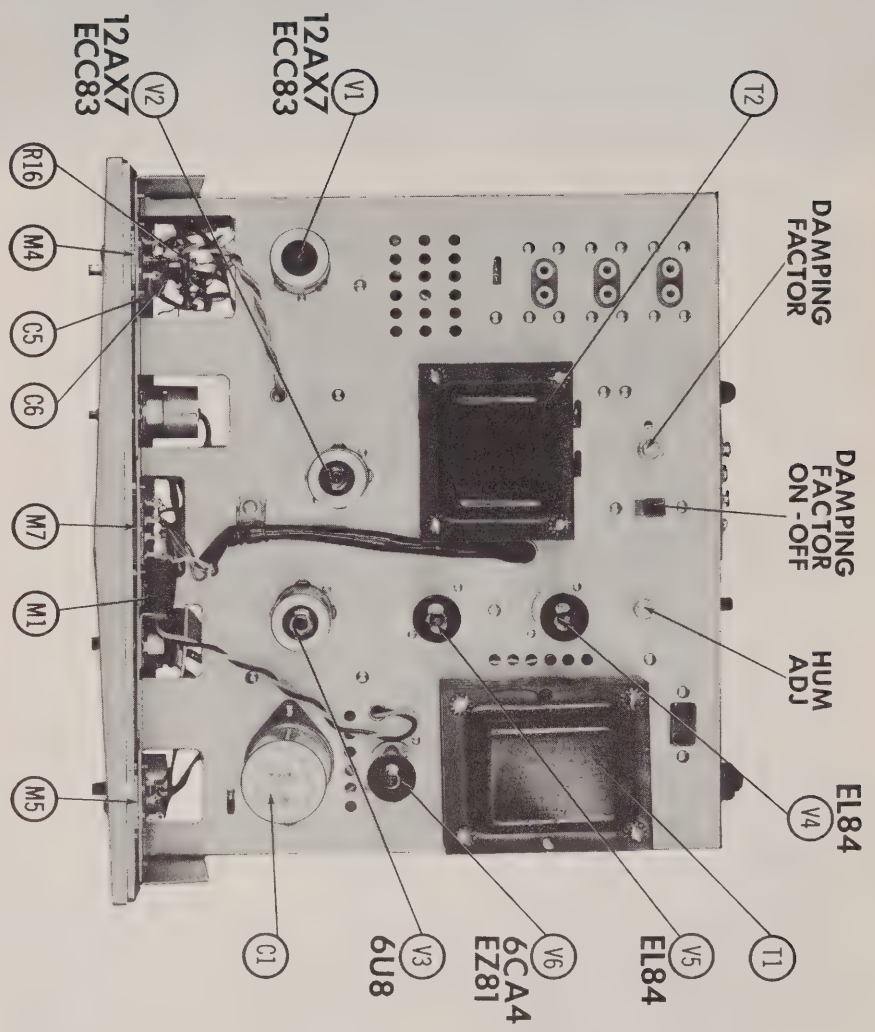
ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA David Bogen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	10			BPD-00001	DD-100	L10Q1	ED-10	UC-541	5GA-Q1	
C5	3300			BPD-0033	DD-332	BYA10D33	ED-0033	UC-5233	5GA-D33	
C6	3300			BPD-0033	DD-332	BYA10D33	ED-0033	UC-5233	5GA-D33	
C7	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C8	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C9	.047	200		BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C10	.01	200		BPD-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C11	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5GA-D47	①
C12	2200			BPD-0022	DD-222	BYA10D22	ED-0022	UC-5222	5GA-D22	②
C13	.1	200		P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	③
C14	.022	200		BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	2TM-S22	
C15	100			BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C16	8.2			NP0-SI 8.2	TCZ-8R2	C10V82C	TCO-8.2		5TCCB-V82	④
C17	3300			BPD-0033	DD-332	BYA10D33	ED-0033	UC-5233	5GA-D33	
C18	3300			BPD-0033	DD-332	BYA10D33	ED-0033	UC-5233	5GA-D33	
C19	.022	200		BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	2TM-S22	③
C20	.1	200		P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C21	4700			BPD-0047	DD-472	BYA10D47	GP-4700	UC-5247	5HK-D47	
C22	270			BPD-00027	DD-271	L10T27	ED-270	UC-5327	5GA-T27	
C23	4.7			NP0-SI 4.7	TCZ-4R7	C10V47C	TCO-4.7	ZT-5547	5TCCB-V47	
C24	.047	200		BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C25	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C26	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C27	1500			BPD-0015	DD-152	BYA10D15	ED-0015	UC-5215	5HK-D15	
C28	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5GA-D47	

① Some versions may use 6800MMF in this application.
② Some versions may use 3300MMF in this application.
③ Some versions may use .047MFD in this application.
④ Some versions may use 10MMF in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA David Bogen PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	V385	AB-60	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			AK-7	FS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	
R2A	1Meg	½	V386	AB-69	A47-1Meg-S	Q11-137	U54	Bass
B	Shaft			AK-7	FS-3	Not Req.	Not Req.	
R3A	500K	½	V387	ABT-65	A47F5-500K	Q19-133X	UT431	Treble, Tap ② 250K
B	Shaft			AK-7	FS-3	Not Req.	Not Req.	
R4A	100Ω	½	V388					Damping Factor
B	Shaft							
R5A	50Ω	2	V113	WN-500	A43-50	WPS50	R50L	Hum Adjust (Wire Wound)
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	David Bogen PART No.	IRC PART No.	
R6	120K			BTS-120K	
R7	2.2Meg			BTS-2.2Meg	
R8	100K			BTS-100K	Note 1
R9	220K				Note 2
R10	4.7Meg			BTS-4.7Meg	Note 3
R11	1800Ω				Note 4
R12	8200Ω			BTS-8200	
R13	100K			BTS-100K	
R14	56K			BTS-56K	
R15	4700Ω			BTS-4700	
R16	10K			BTS-10K	
R17	470K			BTS-470K	
R18	3.3Meg			BTS-3.3Meg	
R19	220K				Note 2
R20	1Meg			BTS-1Meg	
R21	120K			BTS-120K	Note 5
R22	3300Ω			BTS-3300	Note 6
R23	100K			BTS-100K	
R24	100K			BTS-100K	
R25	470K			BTS-470K	
R26	180K			BTS-180K	Note 5
R27	220K			BTS-220K	Note 3
R28	8200Ω			BTS-8200	Note 3
R29	100K 5%			BTS-100K 5%	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	David Bogen PART No.	IRC PART No.	
R30	1200Ω			BTS-1200	Note 7
R31	470K			BTS-470K	
R32	8200Ω			BTS-8200	Note 8
R33	390K			BTS-390K	
R34	1200Ω			BTS-1200	
R35	120K			BTS-120K	
R36	8200Ω			BTS-8200	Note 9
R37	180K			BTS-180K	
R38	390Ω			BTS-390	
R39	470K			BTS-470K	
R40	470K			BTS-470K	
R41	22Meg			BTS-22Meg	
R42	100K			BTS-100K	
R43	1.5Meg			BTS-1.5Meg	
R44	3900Ω	1		BTA-3900	Note 10
R45	33K	4			Note 11
R46	150Ω	2		BTB-150	
R47	.47Ω	2			
R48	1Ω	2			
R49	16Ω 5%			BTS-16 5%	Note 12
R50	150Ω	2		BTB-150	
R51	12K			BTS-12K	Note 13
R52	8200Ω	4		PW4-8200	
R53	1Ω	2			

Note 1. Some versions may use 3.3Meg.
Note 2. Special Low Noise Deposited Resistor.
Note 3. Not used in some versions.
Note 4. Some versions may use 820Ω.
Note 5. Some versions may use 100K.
Note 6. Some versions may use 6800Ω.
Note 7. Some versions may use 3900Ω.
Note 8. Some versions may use 5600Ω.
Note 9. Some versions may use 22K.
Note 10. Some versions may use 4700Ω.
Note 11. Some versions may use 34K 4 W.
Note 12. Some versions may use 33Ω 5%.
Note 13. Some versions may use 10K.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	David Bogen PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ② .75A	78VCT ② .082	6.3VAC ② 3.7A		T3142	P9311 ①	P-2952 ①	PM8409 ①	24R04 ①	R-11B ①

① Tape 5V ② 2A winding & center tap of 6.3V winding.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

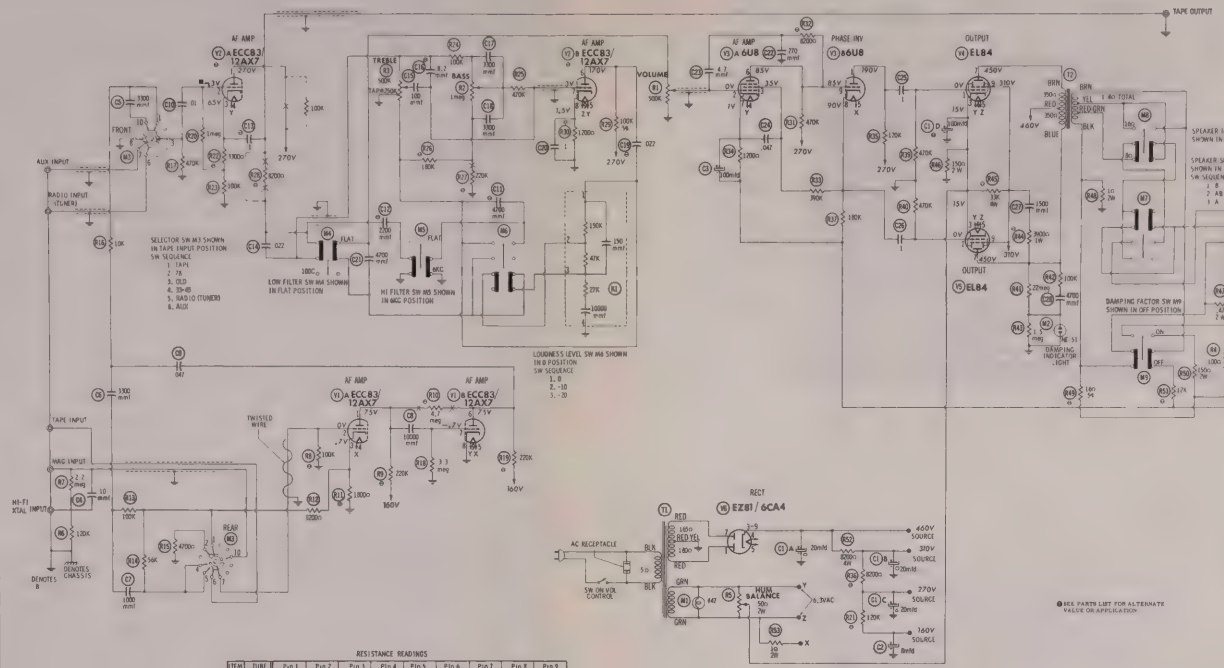
ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	David Bogen PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	19K CT	16Ω Tap ② 8Ω, 4Ω	T2121						

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	David Bogen PART No.	REPLACEMENT DATA
K1	Tone Coup. Net.	150MMF, 10000MMF, 150K, 47K, 27K		Sprague 102C26

MISCELLANEOUS

ITEM No.	PART NAME	David Bogen PART No.	NOTES
M1	Pilot Light		#47
M2	Indicator Light		NE-51
M3	Switch	S464A	Selector (Rotary Wafer Type)
M4	Switch	S381	Low Filter (Slide Type DPST)
M5	Switch	S381	HI Filter (Slide Type DPST)
M6	Switch	S475	Loudness Level (Slide Type DPDT)
M7	Switch	S475	Speaker Selector (Slide Type DPDT)
M8	Switch	S381	Speaker Impedance Selector (Slide Type DPST)
M9	Switch	S476	Damping Factor-On/Off (Slide Type DPST)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83 / 12AX7	* 356K	100K	1800Ω	150Ω	150Ω	† 355K	3.3Meg	0Ω	150Ω
V2	ECC83 / 12AX7	* 15K	1.1Meg	100K	150Ω	150Ω	† 115K	600K	1200Ω	150Ω
V3	6U8	† 1.35K	0Ω	580K	150Ω	150Ω	† 480K	12K	190K	† 480K
V4	EL84	470K	NC	150Ω	150Ω	150Ω	TP	† 350Ω	TP	† 820Ωs
V5	EL84	470K	NC	150Ω	150Ω	150Ω	TP	* 350Ω	TP	† 820Ωs
V6	EZ81 / 6CA4	180Ω	NC	20K-Min9	150Ω	150Ω	NC	165Ω	NC	20K-Min9

ALL MEASUREMENTS TAKEN IN "TAPE" POSITION
† MEASURED FROM PIN 9 OF V6
* MEASURED FROM PIN 3 OF V2
TP TIE POINT
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected

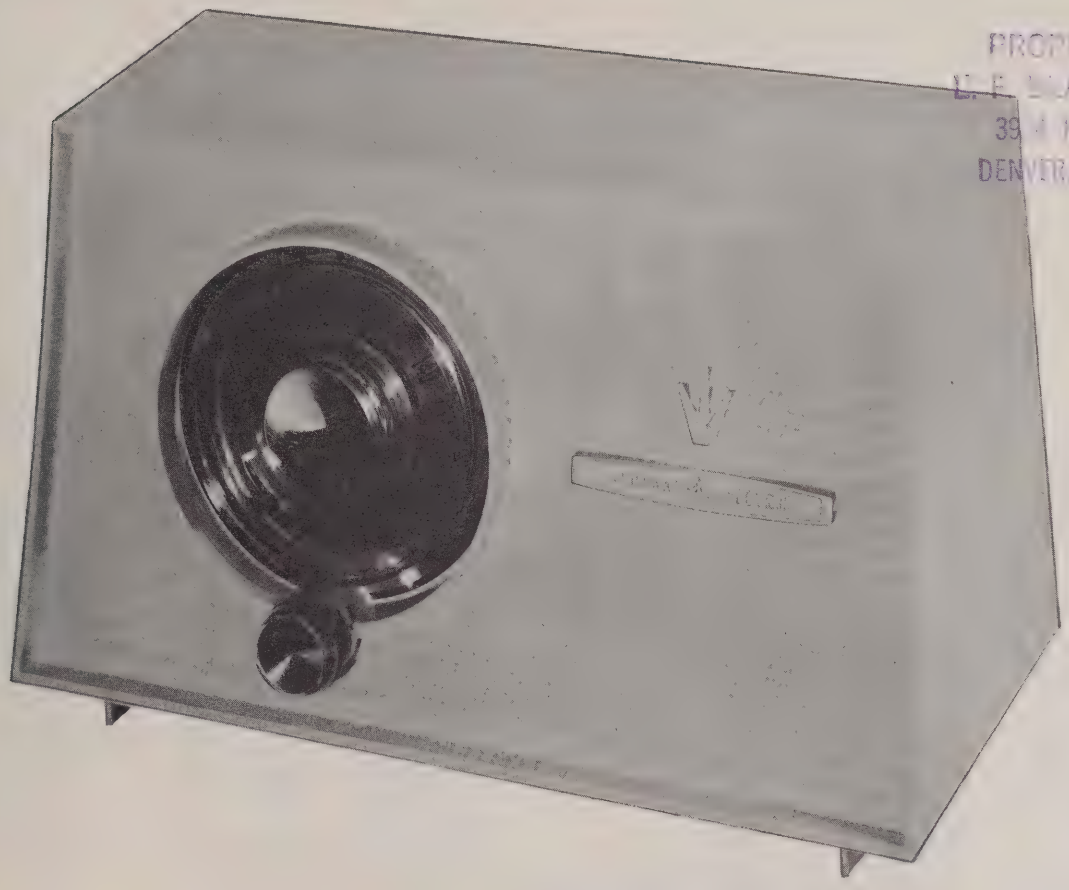
● SEE PARTS LIST FOR ALTERNATE VALVE ON APPLICATION

PHOTOFACT* Folder

*TRADE MARK

GENERAL ELECTRIC
MODELS 875, 876, 877

PROPERTY OF
U. F. SCANTLEBURY
3934 MEADE ST.
DENVER, COLORADO



GENERAL ELECTRIC
MODELS 875, 876, 877

GENERAL ELECTRIC
MODELS 875, 876, 877

TRADE NAME	General Electric Models 875, 876, 877
MANUFACTURER	General Electric Co., Products Service, Radio Receiver Dept., 869 Broad St., Utica, N. Y.
TYPE SET	AC-DC Operated AM Receiver
TUBES (Five)	Types 12AU6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC-DC
RATING	.27 Amp. @ 117 Volts AC (26 Watts)
TUNING RANGE—BROADCAST	535KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 1 (grid) of 12AU6 (V1). Low side to B-.	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1500KC	Tune to 1500KC signal	"	A6	Adjust for maximum output while rocking tuning gang.

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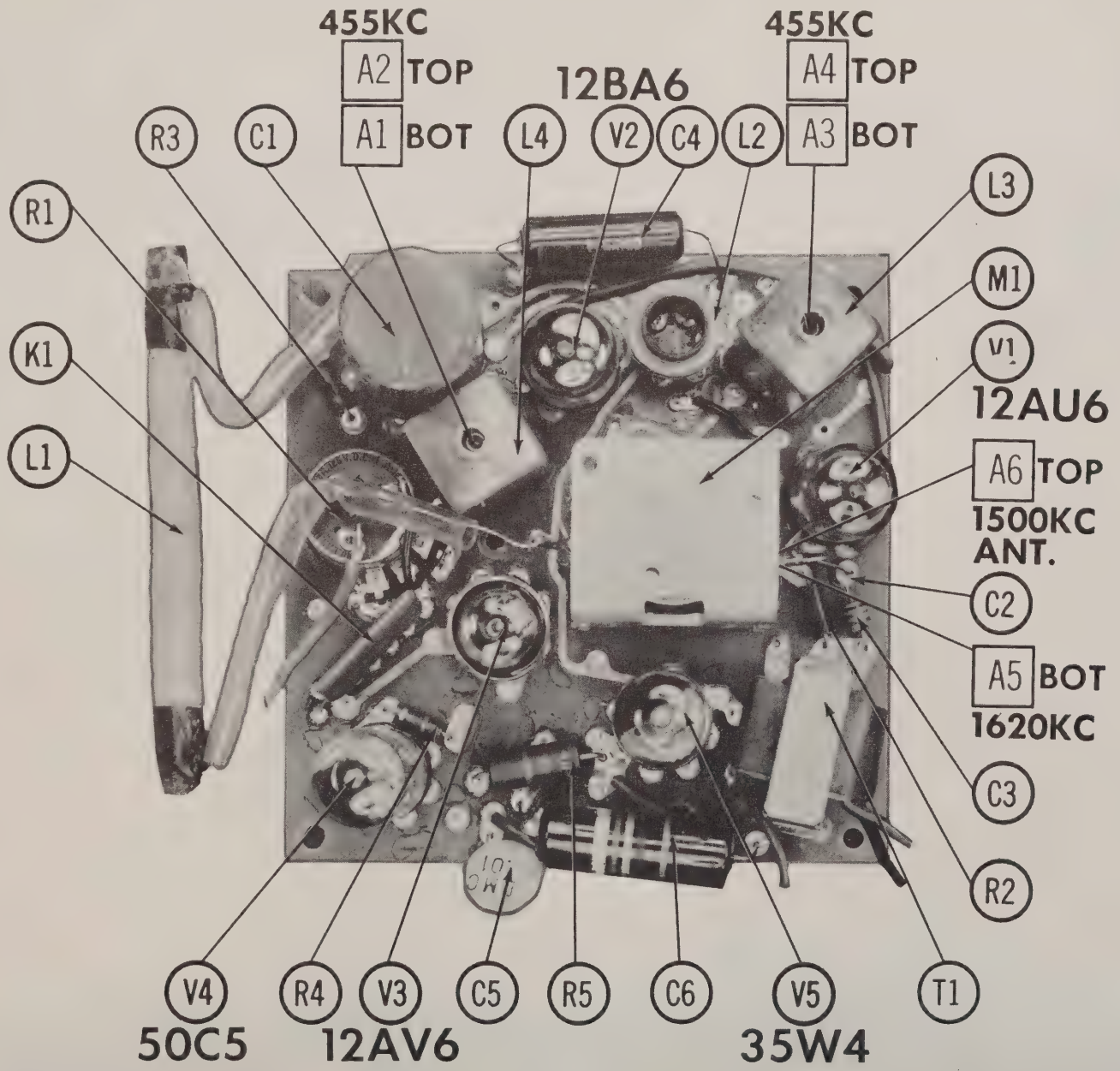


CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12AU6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF Amp.	12AV6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	G. E. PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150	RCE-207	PRS150V5030	BBRD5315	WD210	TDLD-8	MTD-301	TVA-2450
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	G. E. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	22		RCW-3196	SI 22	D6-220	LT6Q22	GP-22	UC-5422	5GA-Q22	
C3	22		RCW-3196	SI 22	D6-220	LT6Q22	GP-22	UC-5422	5GA-Q22	
C4	.05	200	RCC-086	BPD-05	DF-503	CUB2S5		GEM-215	2TM-S5	
C5	10000		RCW-3186	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C6	.047	600	RCN-053	BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	G. E. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	500Ω	½	RRC-374					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	G. E. PART No.	IRC PART No.	
R2	2. 2Meg			BTS-2. 2Meg	
R3	2. 2Meg			BTS-2. 2Meg	
R4	180Ω			BTS-180	
R5	1500Ω	2		BTB-1500	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	G. E. PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2700Ω	3-4Ω	RTO-176	Z1101 ①	A-3025①	A-3332①	26S58 ②	S-12X ①	① Use original mounting frame. ② Bend ears down.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	G. E. PART No.	QUAM PART No.	
SP1	4	PM	3-4Ω	ROP-033	4A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		G. E. PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	RLL-064				
L2	Osc. Coil	RLC-135				
L3	Input IF	RTL-183	16-6780	BC-356	13-PC9	
L4	Output IF	RTL-183	16-6780	BC-357	13-PC10	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	G. E. PART No.	REPLACEMENT DATA
K1	Audio Coup. Net.	5000MMF, 220MMF, 2000MMF, 400MMF, 470K, 470K, 6. 8Meg	RCW-3207	

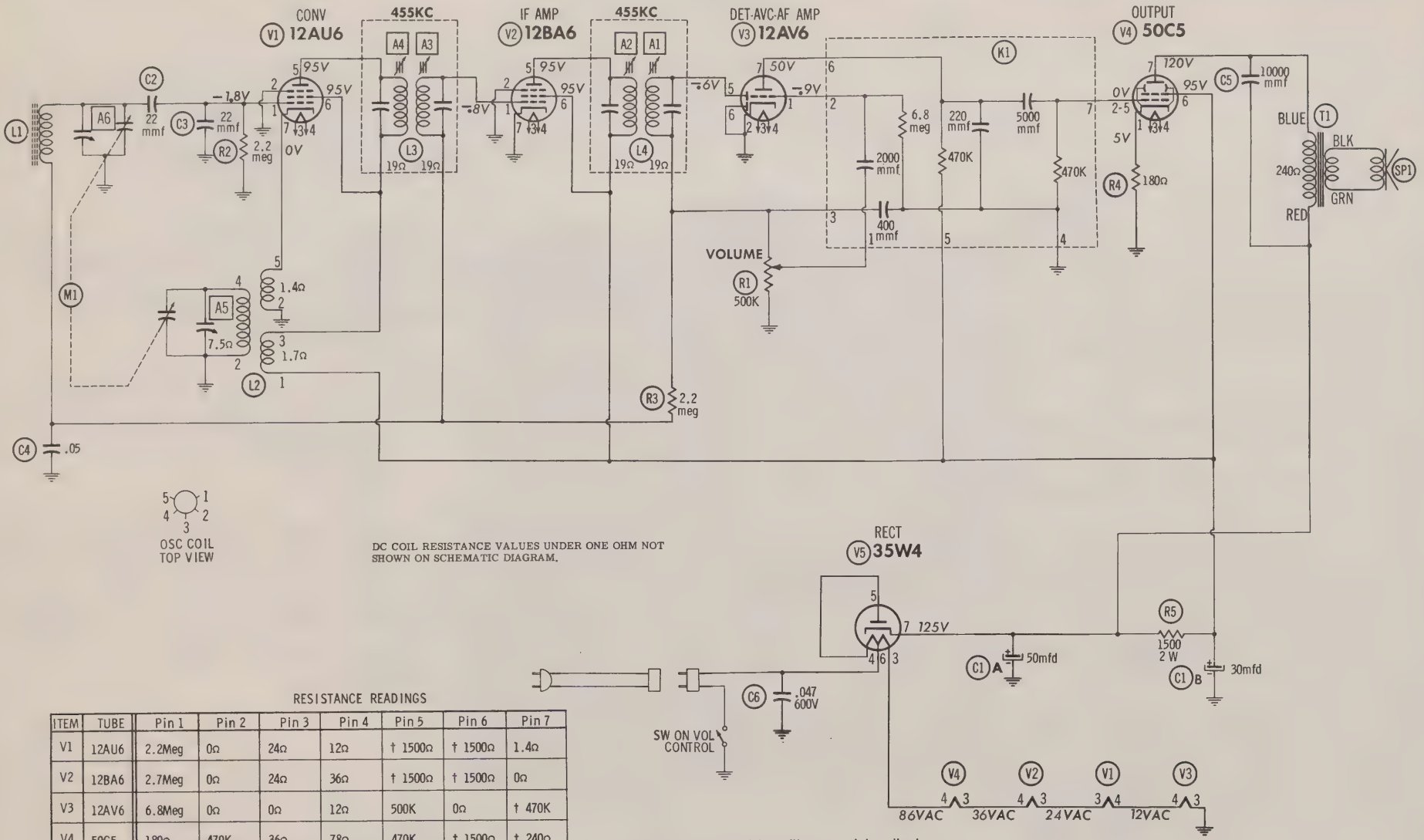
MISCELLANEOUS

ITEM No.	PART NAME	G. E. PART No.	NOTES
M1	Tuning Cap.	RCT-093	2 Gang (Ant. 18-290MMF, Osc. 22-130MMF)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	RDK-425	On-Off-Volume
Knob	RDK-588	Tuning
Dial	RDG-016	
Cabinet	RAU-469	Mahogany, Model 875
Cabinet	RAU-470	White, Model 876
Cabinet	RAU-471	Pink, Model 877



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AU6	2.2Meg	0Ω	24Ω	12Ω	† 1500Ω	† 1500Ω	1.4Ω
V2	12BA6	2.7Meg	0Ω	24Ω	36Ω	† 1500Ω	† 1500Ω	0Ω
V3	12AV6	6.8Meg	0Ω	0Ω	12Ω	500K	0Ω	† 470K
V4	50C5	180Ω	470K	36Ω	78Ω	470K	† 1500Ω	† 240Ω
V5	35W4	NC	TP	78Ω	115Ω	115Ω	105Ω	20K(Min)

† MEASURED FROM PIN 7 OF V5
TP TIE POINT
NC NO CONNECTION

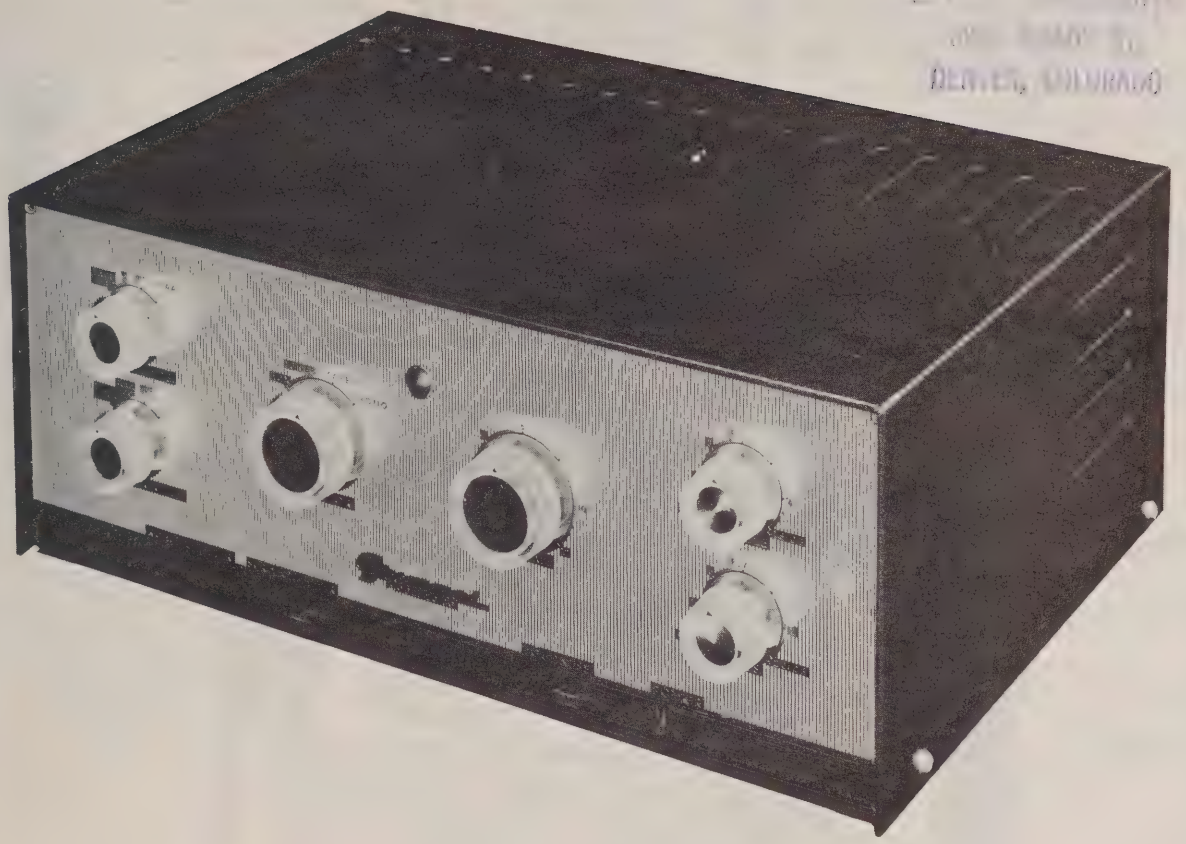
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

PHOTOFACT* Folder

GROMMES MODEL 20PG

GROMMES MODEL 20PG

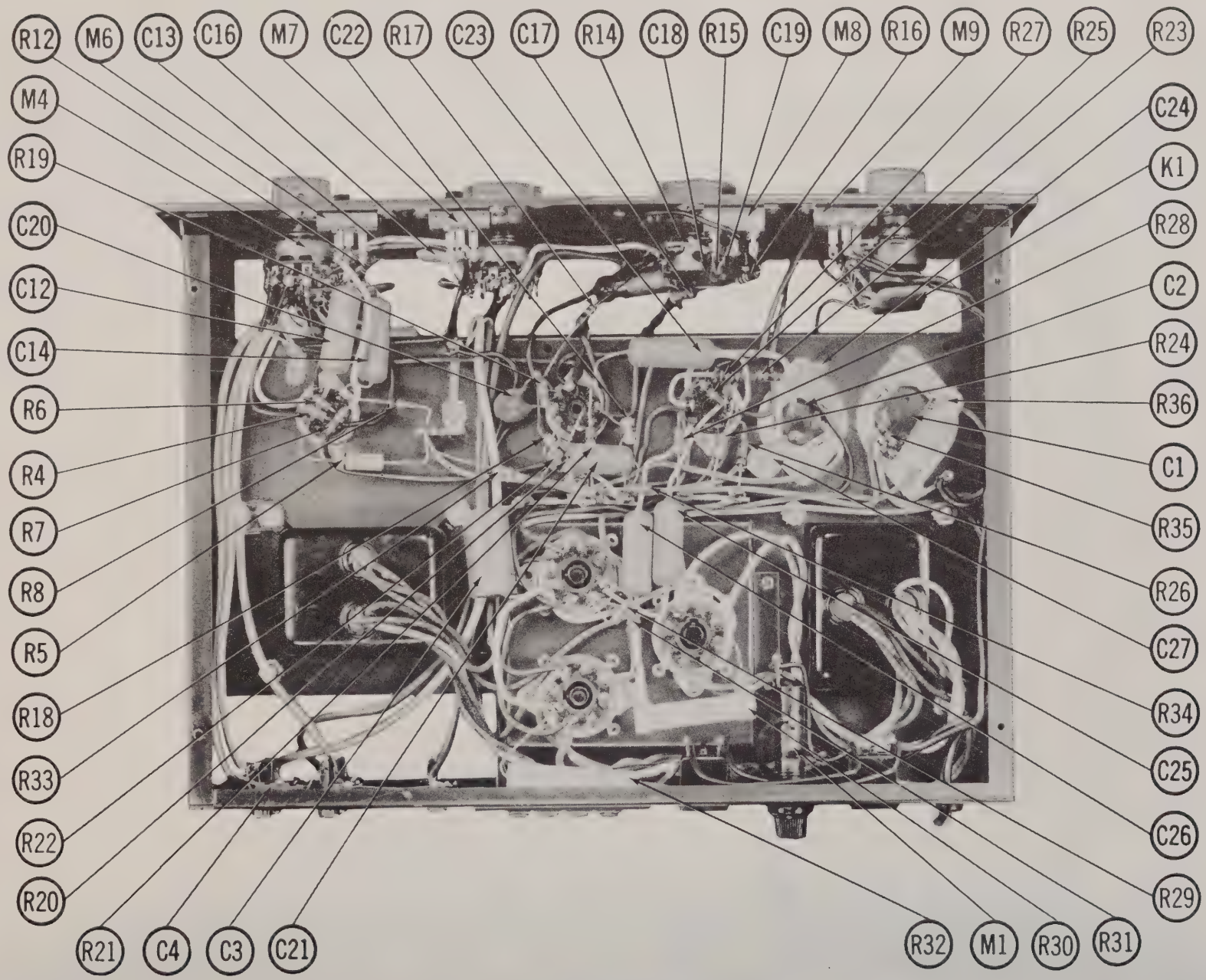


GROMMES MODEL 20PG

TRADE NAME	Grommes Model 20PG
MANUFACTURER	Precision Electronics, Inc., 9101 King Ave., Franklin Park, Illinois
TYPE SET	AC Operated 20 Watt 6 Channel Audio Amplifier
TUBES (Six)	Types 12AX7 Phono Preamplifier, 12AX7 AF Amplifier, 12AX7 AF Amp.-Phase Inv., (2) 6L6GT Output, 5U4G Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .95 Amp. @ 117 Volts AC (93 Watts)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1957 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Phono Preamplifier	12AX7	
V2	AF Amplifier	12AX7	
V3	AF Amp. - Phase Inv.	12AX7	
V4	Output	6L6GT	
V5	Output	6L6GT	
V6	Rectifier	5U4G	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA GROMMES PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	450		AFH3-50-05	CO372	FP396.1	TMQ-18	Q-060	TVL-3842
B	■20	450							
C	▲20	450							
C2A	■10	250		AFH3-86-90	BO200	FP231	TMD-23	D-105	
B	▲10	250			BBR100-15	TC2503	TD-100-15	MTH-1510	
C	100	15							
C3	20	25		PRS50V20	BBR20-25	TC45	TD20-150	MT-0220	TVA-1205

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

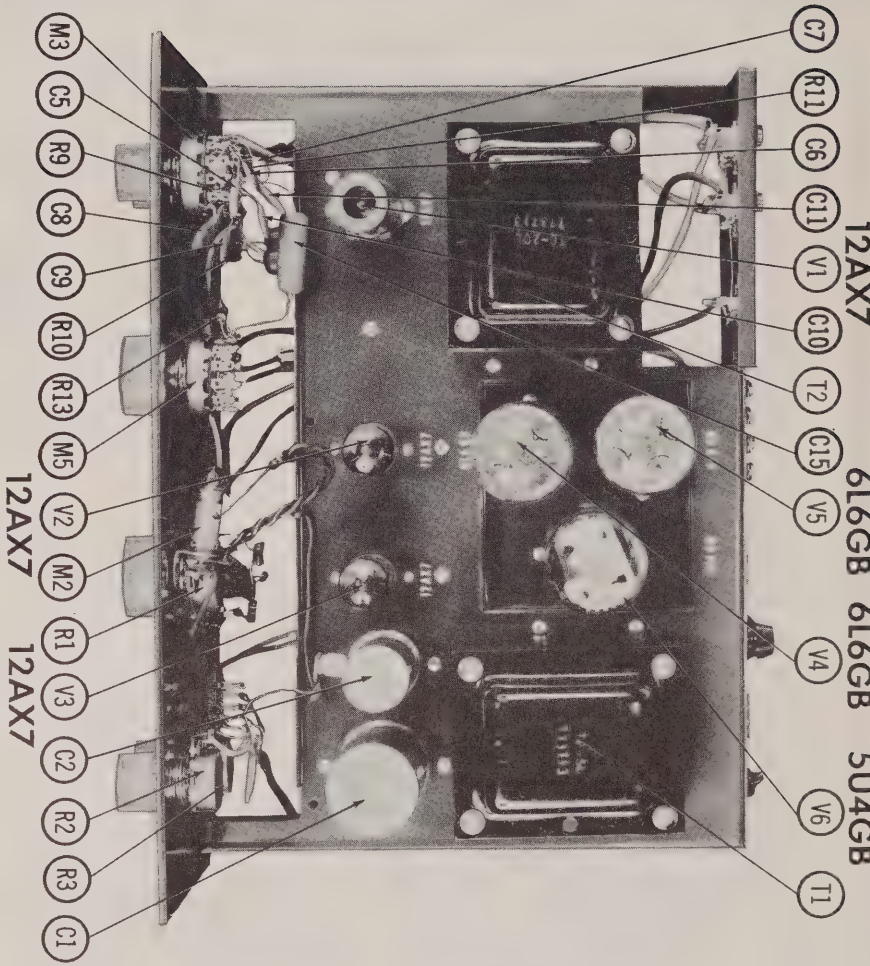
ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA GROMMES PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	100			1468-0001		5W5T1			1FM-31	
C5	1500						ED-1500			10%
C6	800									10%
C7	330				D6-331	L10T33	ED-330			10%
C8	4000									10%
C9	2000									10%
C10	2000									10%
C11	1000						ED-1000			10%
C12	.047	400		P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C13	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C14	.047	400		P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C15	.047	400		P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C16	1000						ED-1000			10%
C17	51			SI 51		L10Q51	GP-51			
C18	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C19	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C20	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C21	.047	400		P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C22	20			SI 20	D6-200	LT6Q2	GP-20	UC-542	5GA-Q2	①
C23	.047	400		P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C24	250				D6-251	L10T25	ED-250			10%
C25	.047	400		P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C26	.047	400		P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C27	1000						ED-1000			10%

① Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA GROMMES PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	MLC500K2T	BT-160		Q18-133XX	UDT-283	Volume, Tap② 100K & 200K
B	Shaft			Not Req.		Not Req.	Not Req.	
R2A	1Meg	½	GTC-1M	B-69	A47-1Meg-S	Q11-137	U54	Treble
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R3A	1Meg	½	GTC-1M	B-69	A47-1Meg-S	Q11-137	U54	Bass
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	GROMMES PART No.	IRC PART No.	
R4	47K			BTS-47K	
R5	100K	1		BTA-100K	
R6	1000Ω			BTS-1000	
R7	3.3Meg			BTS-3.3Meg	
R8	100K			BTS-100K	
R9	100K			BTS-100K	
R10	1Meg			BTS-1Meg	
R11	3.3Meg			BTS-3.3Meg	
R12	4.7Meg			BTS-4.7Meg	
R13	100K			BTS-100K	
R14	47K			BTS-47K	
R15	22K			BTS-22K	
R16	470K			BTS-470K	
R17	100K			BTS-100K	
R18	470K			BTS-470K	
R19	3.3Meg			BTS-3.3Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	GROMMES PART No.	IRC PART No.	
R20	100K			BTS-100K	
R21	100K			BTS-100K	
R22	1000Ω			BTS-1000	
R23	10K			BTS-10K	
R24	220K			BTS-220K	
R25	100Ω			BTS-100	
R26	1000Ω			BTS-1000	
R27	47K			BTS-47K	
R28	220K			BTS-220K	
R29	220K			BTS-220K	
R30	30K	4			①
R31	270K			BTS-270K	
R32	250Ω	10		PW10-250	②
R33	47K			BTS-47K	
R34	22K			BTS-22K	
R35	1000Ω			BTS-1000	
R36	5600Ω	5			

① Some versions may use 54K in this application.
② Some versions may use 200Ω in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	GROMMES PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ② .95A	740VCT ② .120A	5VAC ② 3A	6.3VCT ② 2.6A	TP-5L					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	GROMMES PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5200Ω CT	16Ω Tap ② 8Ω, 4Ω	TO-20L				22S70 ①		① Fabricate mounting. Tape 250Ω & 500Ω taps.

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

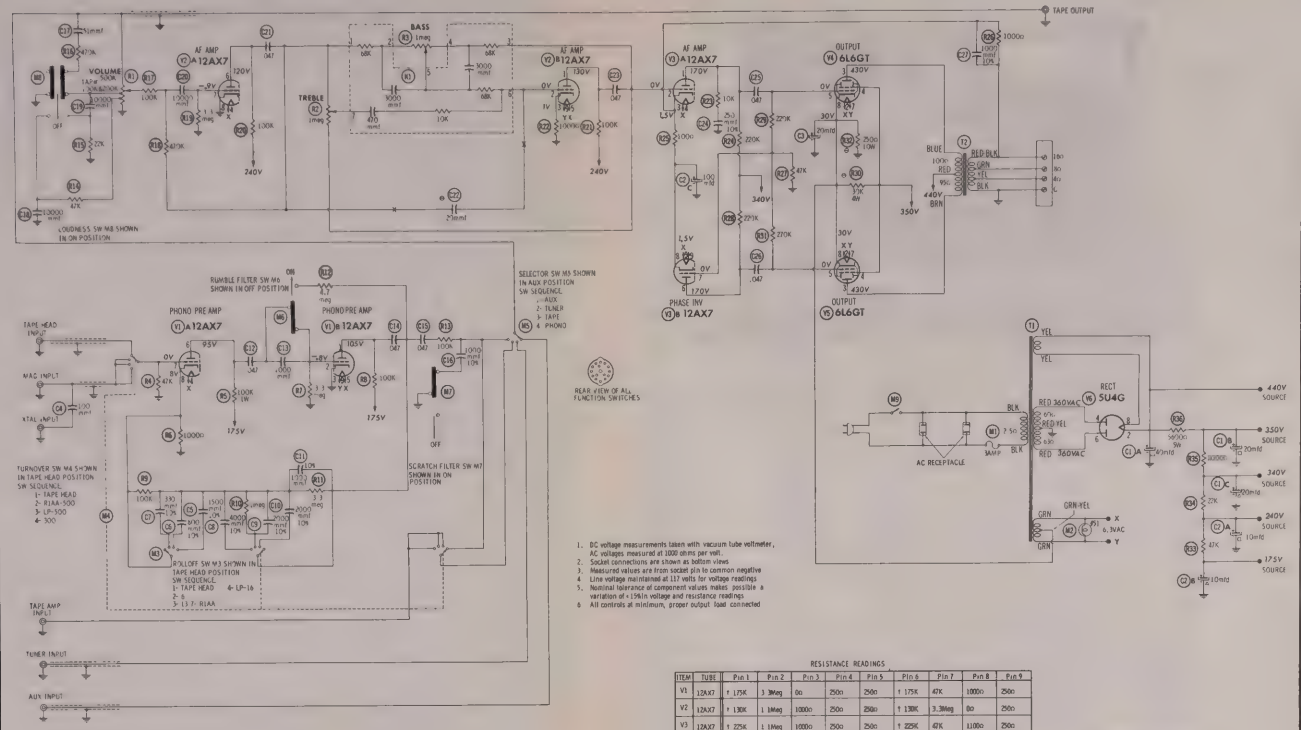
ITEM No.	USE	DESCRIPTION	GROMMES PART No.	REPLACEMENT DATA
K1	Tone Compensating	3000MMF, 3000MMF, 470MMF, 68K, 68K, 68K, 10K	S191B	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			GROMMES PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	3A			312003.	342001	AGC3	HKP

MISCELLANEOUS

ITEM No.	PART NAME	GROMMES PART No.	NOTES
M2	Pilot Light		#51
M3	Switch		Roll Off (Rotary Wafer Type)
M4	Switch		Turnover (Rotary Wafer Type)
M5	Switch		Selector (Rotary Wafer Type)
M6	Switch		Rumble Filter (Slide Type DPST)
M7	Switch		Scratch Filter (Slide Type DPST)
M8	Switch		Loudness (Slide Type DPST)
M9	Switch		On-Off (Slide Type DPST)



1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings
6. All controls at minimum, proper output load connected

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	↑ 175K	3.3Meg	0Ω	250Ω	250Ω	↑ 175K	47K	100Ω	250Ω
V2	12AX7	↑ 130K	1.1Meg	100Ω	250Ω	250Ω	↑ 130K	3.3Meg	0Ω	250Ω
V3	12AX7	↑ 225K	1.1Meg	100Ω	250Ω	250Ω	↑ 225K	47K	1100Ω	250Ω
V4	6L6GT	NC	250Ω	↑ 100Ω	↑ 5600Ω	265K	TP	250Ω	250Ω	
V5	6L6GT	NC	250Ω	↑ 95Ω	↑ 5600Ω	320K	NC	250Ω	250Ω	
V6	5U4G	NC	20K(Min)	TP	60Ω	NC	63Ω	NC	20K(Min)	

ALL MEASUREMENTS TAKEN IN AUX. POSITION
↑ MEASURED FROM PIN 8 OF V6
TP TIE POINT
NC NO CONNECTION

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

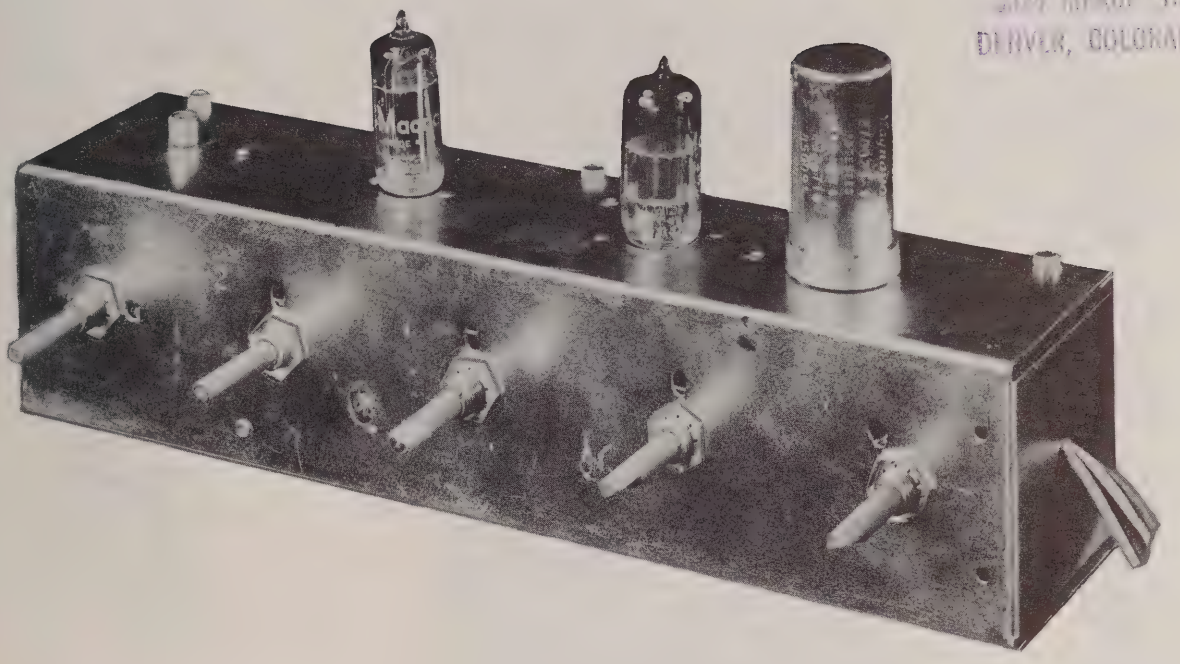
PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

MAGNAVOX
CHASSIS AMP-165AA

MAGNAVOX
CHASSIS AMP-165AA



MAGNAVOX
CHASSIS AMP-165AA

TRADE NAME	Magnavox Chassis AMP-165AA
MANUFACTURER	Magnavox Co., 2131 Bueter Road, Fort Wayne 4, Indiana
TYPE SET	Externally Powered Phono Preamplifier
TUBES (Two)	Types 6AV6 AF Amplifier, 12AT7 AF Amp. - Cathode Follower
POWER SUPPLY	Externally Powered

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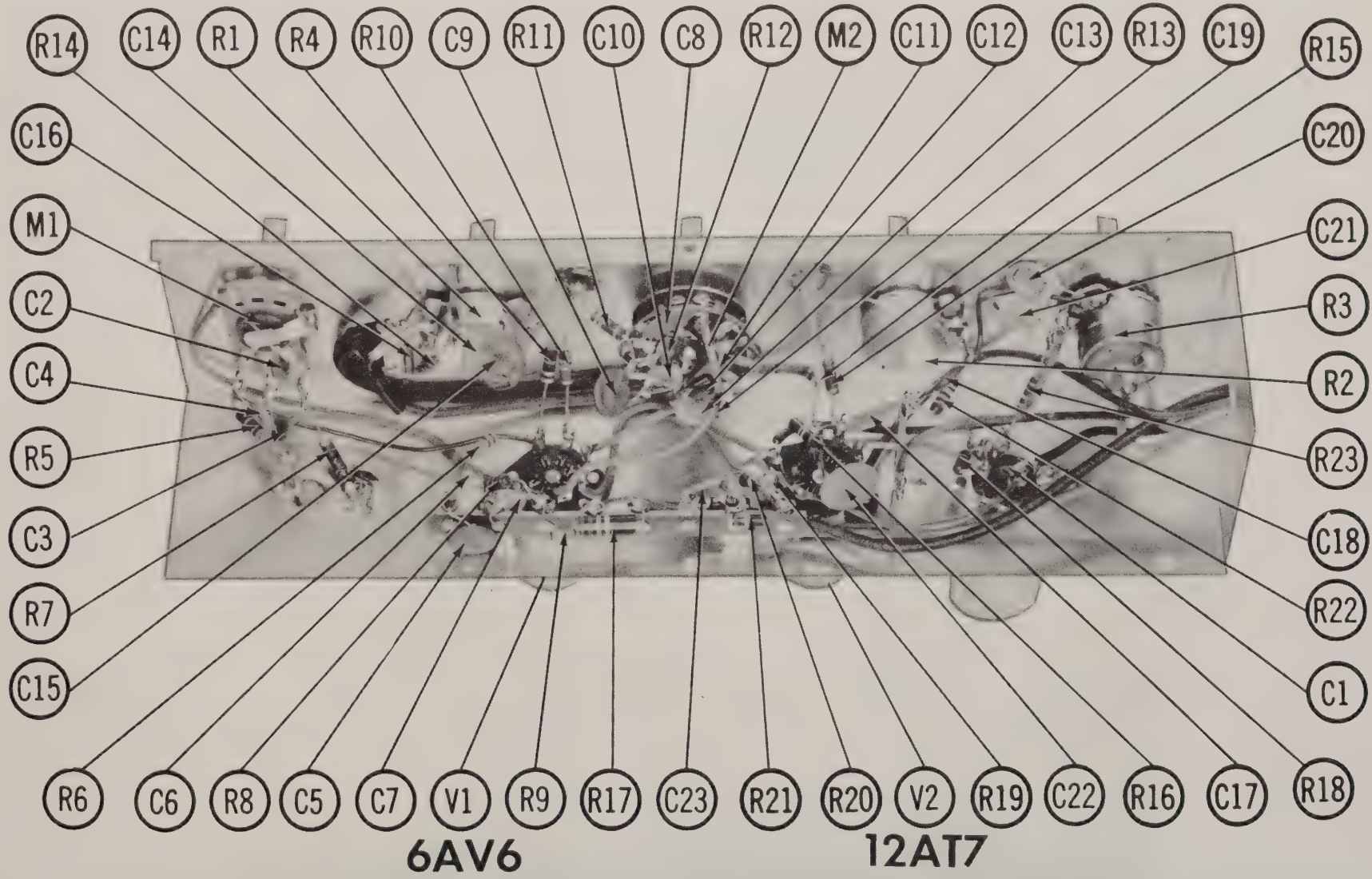


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	6AV6	

ITEM No.	USE	TYPE	NOTES
V2	AF Amp. -Cathode Follower	12AT7	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■20	350	270023-19	AFH2-38	B0610	FP144	TMD-36	D-165	TVL-2615
B	▲30	25				TC47			

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	330		250218-26	BPD-00033	DD-331	L10T33	ED-330	UC-5333	5GA-T33	
C3	220		250218-5	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C4	470		250218-6	BPD-00047	DD-471	L10T47	ED-470	UC-5347	5GA-T47	
C5	1000		250218-8	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C6	100		250218-22	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C7	1500		250218-18	BPD-0015	DD-152	BYA10D15	ED-1500	DC5215	5HK-D15	
C8	10000		250218-19	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C9	1500		250218-18	BPD-0015	DD-152	BYA10D15	ED-1500	DC5215	5HK-D15	
C10	220		250218-5	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C11	220		250218-5	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C12	33		250218-21	BPD-000033	DD-330	L10Q33	ED-33	UC-5433	5GA-Q33	
C13	68		250218-7	BPD-000068	DD-680	L10Q68	ED-68	UC-5468	5GA-Q68	
C14	47		250218-17	BPD-000047	DD-470	L10Q47	UC-5447	UC-5447	5GA-Q47	
C15	5000		250175-30	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C16	220		250218-5	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C17	10000		250218-19	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C18	1000		250218-8	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C19	100		250218-22	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C20	5000		250175-30	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C21	5000		250175-30	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C22	10000		250218-19	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C23	5000		250175-30	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	220074-12	ABT-7417	A47-F3-1Meg	Q18-137X		Volume, Tap @ 100K
B	Shaft			AK-7	FS-3	Not Req.		
R2A	1Meg	½	220072-29	AB-70	A47-1Meg-Z	Q13-137	U53	Treble
B	Shaft			AK-7	FS-3	Not Req.	Not Req.	
R3A	1Meg	½	220073-20	AB-70	A47-1Meg-Z	Q13-137	U53	Bass
B	Shaft			AK-7	FS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	

RESISTORS

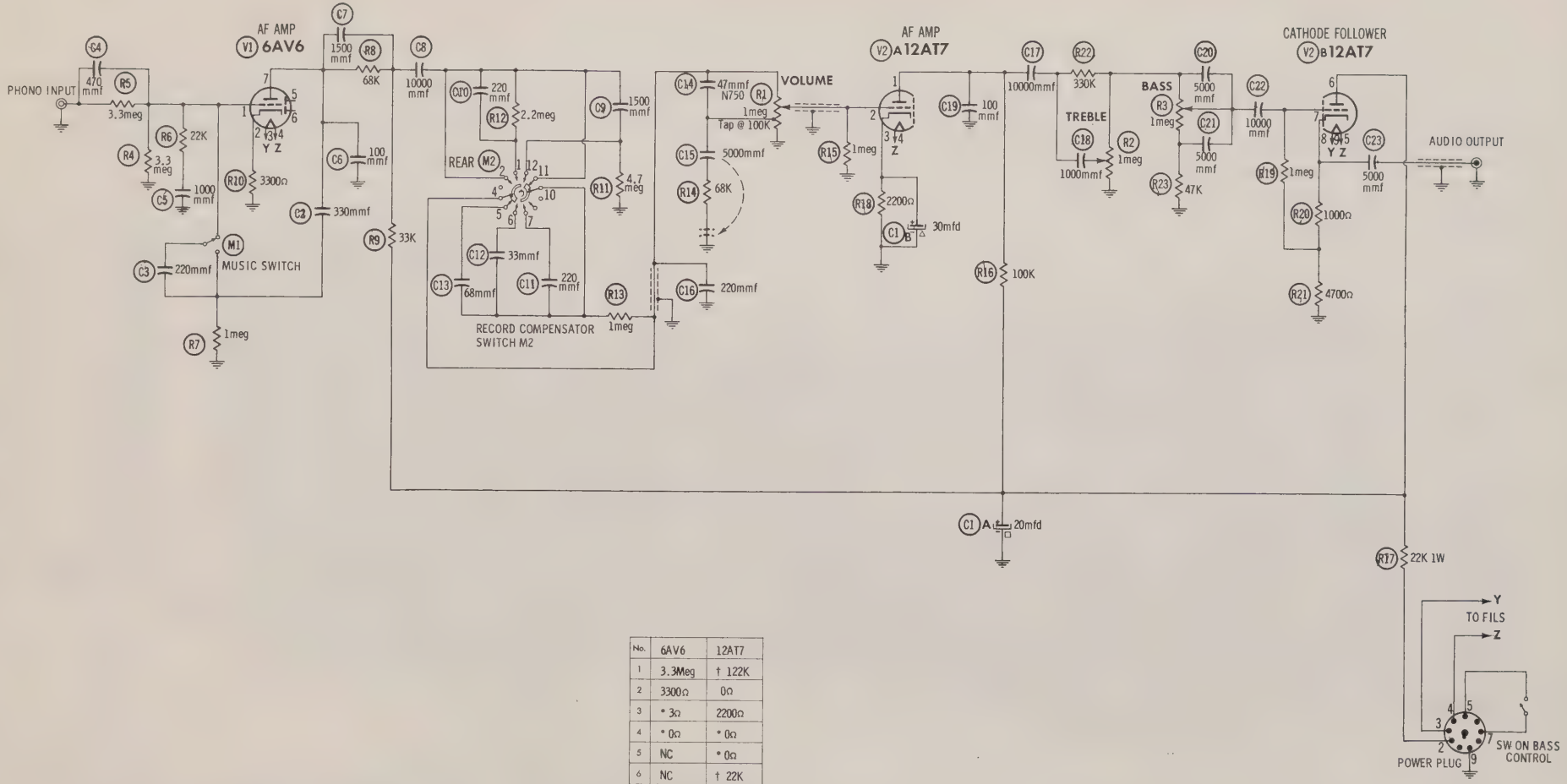
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MAGNAVOX PART No.	IRC PART No.	
R4	3. 3Meg		230104-104	BTS-3. 3Meg	
R5	3. 3Meg		230104-104	BTS-3. 3Meg	
R6	22K		230104-78	BTS-22K	
R7	1Meg		230104-98	BTS-1Meg	
R8	68K		230104-84	BTS-68K	
R9	33K		230104-80	BTS-33K	
R10	3300Ω		230104-68	BTS-3300	
R11	4. 7Meg		230104-106	BTS-4. 7Meg	
R12	2. 2Meg		230104-102	BTS-2. 2Meg	
R13	1Meg		230104-98	BTS-1Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MAGNAVOX PART No.	IRC PART No.	
R14	68K		230104-84	BTS-68K	
R15	1Meg		230104-98	BTS-1Meg	
R16	100K		230104-86	BTS-100K	
R17	22K	1	230105-78	BTA-22K	
R18	2200Ω		230104-66	BTS-2200	
R19	1Meg		230104-98	BTS-1Meg	
R20	1000Ω		230104-62	BTS-1000	
R21	4700Ω		230104-70	BTS-4700	
R22	330K		230104-92	BTS-330K	
R23	47K		230104-82	BTS-47K	

MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M1	Switch	160169-8	Music-Mood (Rotary Wafer Type)
M2	Switch	160278-1	Record Compensator (Rotary Wafer Type)



No.	6AV6	12AT7
1	3.3Meg	† 122K
2	3300Ω	0Ω
3	* 3Ω	2200Ω
4	* 0Ω	* 0Ω
5	NC	* 0Ω
6	NC	† 22K
7	† 123K	1Meg
8		5700Ω
9		* 3Ω

† MEASURED FROM PIN 2 OF POWER PLUG
* MEASURED FROM PIN 4 OF POWER PLUG
NC NO CONNECTION

1. Socket connections are shown as bottom views.
2. Measured values are from socket pin to common negative.
3. Nominal tolerance of component values makes possible a
4. variation of ±15% in voltage and resistance readings.
5. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

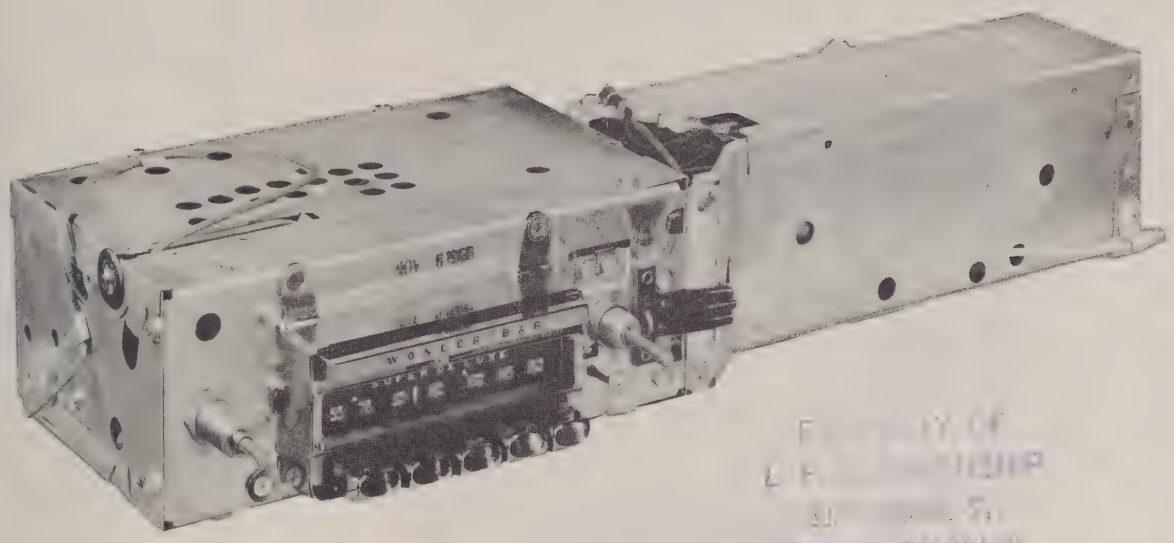
PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

OLDSMOBILE MODEL 989002

OLDSMOBILE MODEL 989002



PROPERTY OF
DENVER, COLORADO

TRADE NAME	Oldsmobile Model 989002 (For 1957 Oldsmobile Automobiles)
MANUFACTURER	Delco Radio Div., G. M. Corp., Kokomo, Indiana
TYPE SET	Battery Operated Custom Built AM Automobile Receiver
TUBES (Eight)	Types 12BA6 RF Amplifier, 12BE6 Converter, 12BA6 IF Amplifier, 12BF6 Det.-AVC-AF Amp., 12AU7 Trigger, (2) 12V6GT Output, 0Z4 Rectifier
POWER SUPPLY	12 Volt Storage Battery — RATING 3.4 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540KC - 1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting. Tone Control to "Treble"

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1	.1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to chassis.	262KC (400∿ Mod)	High frequency end stop	DC probe to point (A). Common to chassis.	A1, A2, A3	To tune to high frequency end stop place a .012" feeler gauge (or bare #28 wire) in slot against high frequency end stop. Tune manually to allow treadle bar arm to run against feeler gauge. Adjust A1, A2, A3 for maximum deflection.
2	"	"	"	"	"	A4	Adjust for MINIMUM deflection.
	Check setting of oscillator core (A8). Rear of core should be 1 5/8" from mounting end of coil form.						
3	68MMF	High side to Antenna Receptacle. Low side to chassis.	1615KC	High frequency end stop	DC probe to point (A). Common to chassis.	A5, A6, A7	Adjust for maximum deflection.
4	"	"	600KC	Tune to 600KC signal	"	A9, A10	"
5	"	"	1615KC	Tune to 1615KC signal	"	A6, A7	"
6	"	"	1100KC	Tune to 1100KC signal	"		If necessary, adjust pointer (with pointer adjustment screw) to coincide with 1100KC on dial.
7	With radio installed in car and antenna fully extended, tune in a weak station between 600KC and 1000KC and adjust A7 for maximum volume.						

PUSHBUTTON ADJUSTMENT

1. Pull pushbutton to left and out.
2. Tune manually to desired station.
3. Press pushbutton in firmly.
4. Repeat procedure on remaining pushbuttons.

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BA6	
V2	Converter	12BE6	
V3	IF Amplifier	12BA6	
V4	Det. -AVC-AF Amp.	12BF6	

ITEM No.	USE	TYPE	NOTES
V5	Trigger	12AU7	
V6	Output	12V6GT	
V7	Output	12V6GT	
V8	Rectifier	0Z4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DELCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■20	400	6322	AFH3-120	C0990	FP345. 8	TMT-106	T-550	TVL-3678
B	▲20	400							
C	20	25							

FIXED CAPACITORS

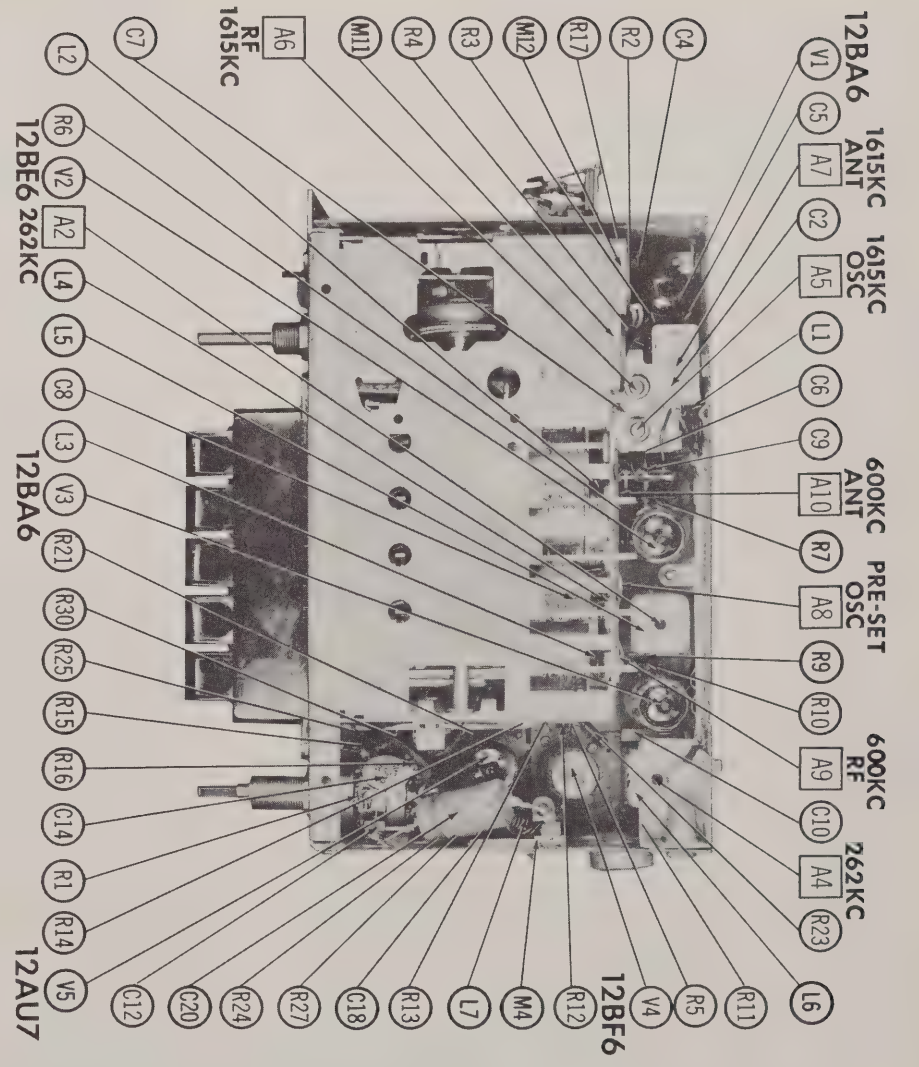
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	DELCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2A			7268811							
B										
C3	.047	200	6612							10%
C4	.047	200	6612							10%
C5	68		6369	NP0-SI 68	TCZ-68	22R5Q68	TCO-68		5TCC-Q68	10%
C6	39		6366	BPD-000039	DD-390	L10Q39	ED-39	UC-5439	5GA-Q39	
C7A			7268828							
B										
C										
D										
C8	200		7268904							N150 5%
C9	.1	400	6613	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C10	100		1219498	1469-0001	TCZ-100	22R5T1	TCO-100	MCE235	MS-31	5%
C11	100		1219498	1469-0001	TCZ-100	22R5T1	TCO-100	MCE235	MS-31	5%
C12	220		G-220	1468-00022	D6-221	5W5T22	ED-220	UC-5322	1FM-322	
C13	.005	600	6631	BPD-005	D6-502	CUB6D5	GP-5000	GEM-625	6TM-D5	
C14	3900			BPD-004	DD-402	L10D39	ED-004	UC-5239	5HK-D4	
C15	220		6375	1469-00022	D6-221	5W5T22	ED-220	UC-5322	1FM-322	
C16	.015	200	7237719	BPD-015	DD16-152	CUB4S15	ED-015	GEM-6115	6TM-S15	
C17	.1	200	6690	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C18	2000		6352	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C19	.003	1000	6563	P1088N-003	DD16-302	CUB10D3		GEM-1023	10TM-D3	
C20	.47	100	6692	P288N-47		CUB2P47		GEM-2047	2TM-P47	
C21	.007	1600	6567	P1688N-007	DD16-702	CUB16D7		GEM-1627	MB-D7	
C22	.1	400	6613	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C23	.47	100	6692	P288N-47		CUB2P47		GEM-2047	2TM-P47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	1/2	7268847				UE1494S	Tone Volume, Tap @ 300K
B	1. 5Meg	1/2						
C	Switch							

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DELCO PART No.	IRC PART No.	
R2	2.2Meg		1239	BTS-2.2Meg	
R3	10K	1	1174	BTA-10K	
R4	330K		1229	BTS-330K	
R5	1.5Meg		1237	BTS-1.5Meg	
R6	100Ω		1113	BTS-100	
R7	22K		1215	BTS-22K	
R8	12K	2	1276	BTB-12K	
R9	10Ω		1101	BTS-10	
R10	150Ω		1115	BTS-150	
R11	100K		1223	BTS-100K	
R12	1Meg		1235	BTS-1Meg	
R13	1000Ω 5%		1220176	BTS-1000 5%	
R14	3300Ω 5%		1220173	BTS-3300 5%	
R15	680K 5%		1220172	BTS-680K 5%	
R16	100K		1223	BTS-100K	
R17	100Ω		1113	BTS-100	
R18	1200Ω			BTS-1200	Note 1
R19	47K			BTS-47K	Note 1

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DELCO PART No.	IRC PART No.	
R20	680K 5%		1220172	BTS-680K 5%	
R21	1Meg		1235	BTS-1Meg	
R22	330K 5%		1219490	BTS-330K 5%	
R23	1.5Meg 5%		1219492	BTS-1.5Meg 5%	
R24	5.6Meg		1244	BTS-5.6Meg	
R25	6800Ω 5%	1	7266367	BTA-6800 5%	
R26	820Ω 5%		7266231	BTS-820 5%	
R27	120K		1224	BTS-120K	
R28	47K	1	1259	BTA-47K	
R29	6800Ω	1	1172	BTA-6800	
R30	47K 5%	1	1220188	BTA-47K 5%	
R31	330K 5%		1219490	BTS-330K	Note 2
R32	47K	1	1259	BTA-47K	
R33	360Ω 5%	1	7234563		Note 3
R34	1800Ω	3			
R35	15K	1	1253	BTA-15K	

Note 1. Not serviced separately, Included with M5 Sensitivity Switch.
Note 2. Not used in some versions.
Note 3. Mfgr. states to replace with 2700Ω 2W (Part #1204) & 5600Ω 1W (Part #1171) connected in parallel.

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	DELCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12.6VCT ② 2.4A	540VCT .068A			6067	V3902	P-2861	P-6489	22R52	V-31

TRANSFORMER (AUDIO INPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2			1220902						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T3	8300Ω CT	4Ω	7269294	Z1011 ①	A-2901②	A-3850②	22S56 ①	S-53X ②	① Use original channel mounting frame. ② Drill new mounting holes.

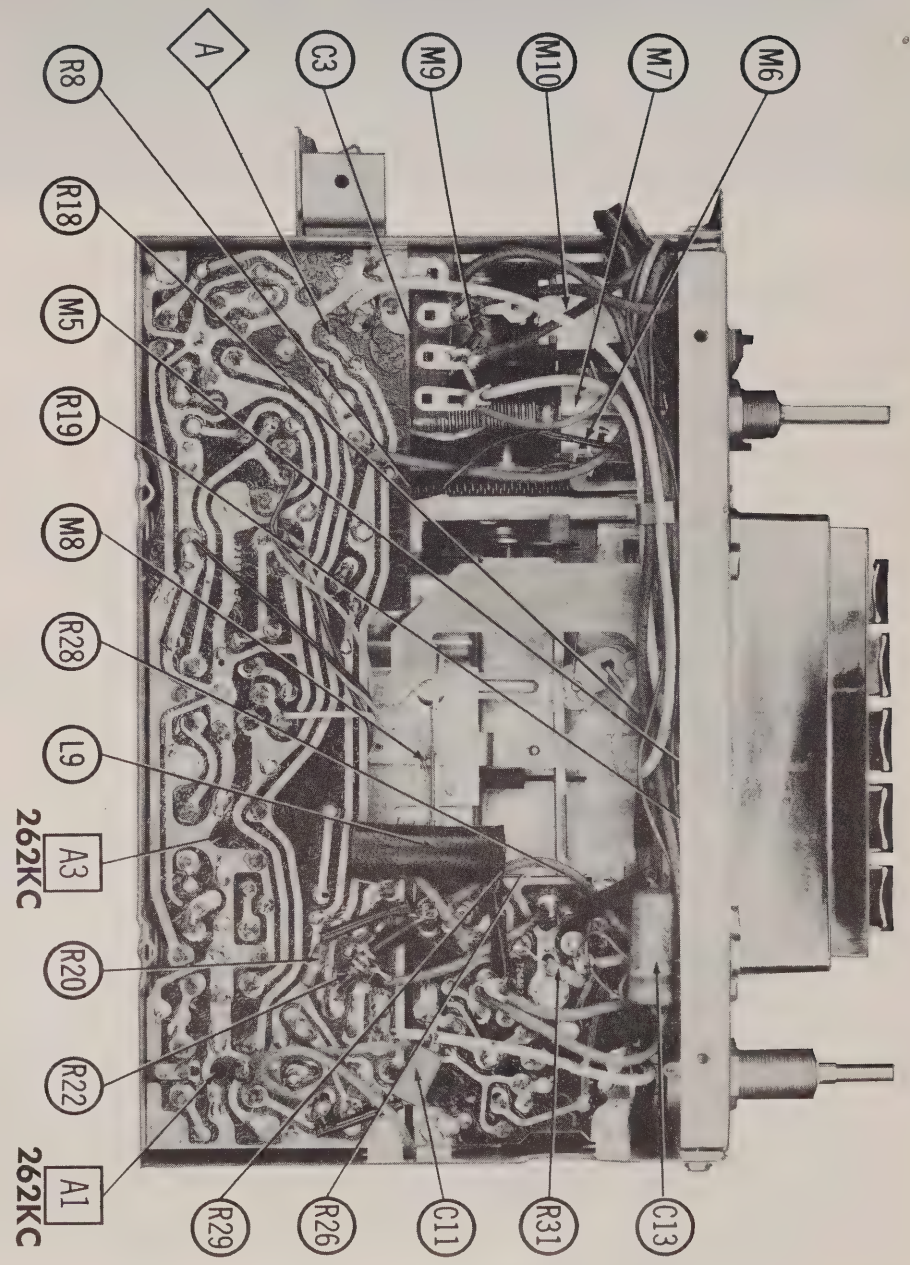
SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	DELCO PART No.	QUAM PART No.	
SP1	6" X 9"	PM	4Ω	7269180	69A3	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		DELCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coupling Coil	7255738	19-1004	BC-565	4610	6.5 Microhenries
L2	Ant. Coil	1221050				
L3	RF Coil	1221050				
L4	Osc. Coil	1221051				
L5	Input IF	1220990	16-6756	BC-317	13-PH1	
L6	Output IF	1220992		BC-320		
L7	Fil. Choke	7241708				
L8	Vib. Hash Choke	1221077				42 Microhenries
L9	Fil. Choke	7269046				

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				DELCO PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	12. 6V	115~	8555	6330	G1602/G883	6330	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			DELCO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	7½A	455640		30307. 5 (7AG-7½)		SFE 7½A	

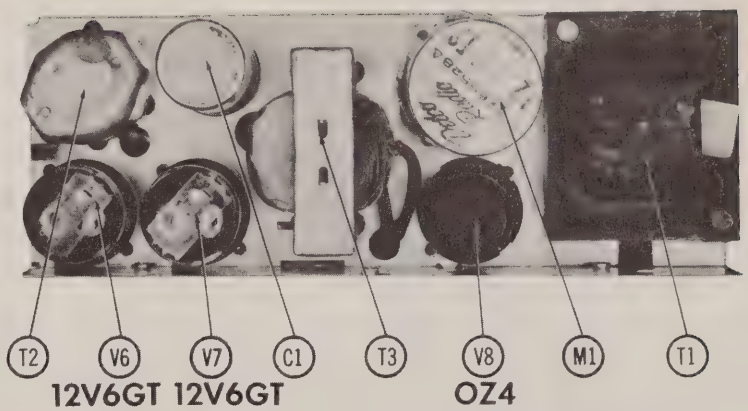
MISCELLANEOUS

ITEM No.	PART NAME	DELCO PART No.	NOTES
M3	Dial Light	456985	#1891
M4	Spark Plate	1220682	
M5	Switch	7268842	Sensitivity
M6	Switch	7268030	Power Solenoid
M7	Switch	7268030	Treadle Solenoid
M8	Switch	7269292	Station Selector
M9	Switch	7258903	Foot
M10	Relay	7269582	Tuner
M11	Solenoid	7268040	Power
M12	Solenoid	7268050	Treadle

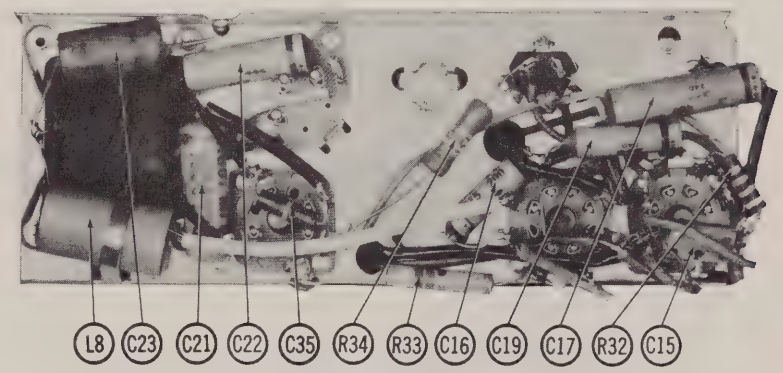
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

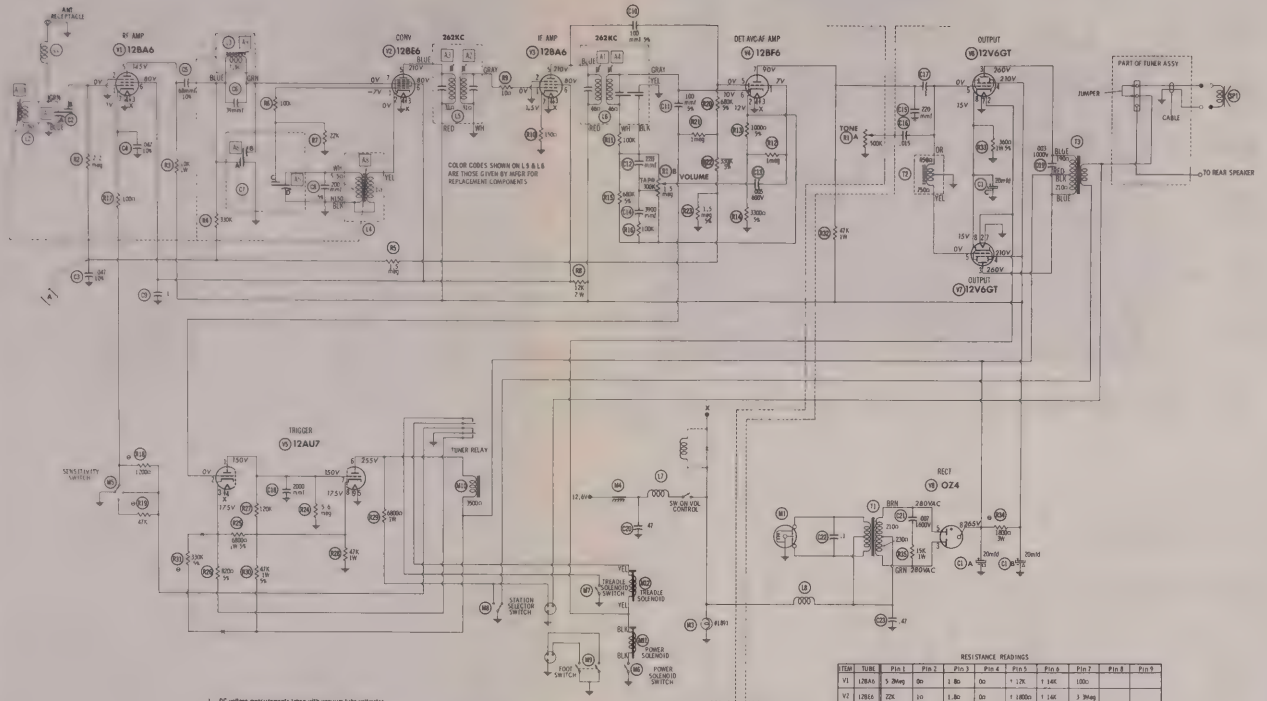
NAME	PART NO.	DESCRIPTION
Knob	569556	Control
Knob	569554	Tone
Knob	569555	Dummy
Dial	7268851	
Printed Panel	7268821	1 Tube Section
Printed Panel	7268814-C	4 Tube Section



POWER CHASSIS TOP VIEW



POWER CHASSIS BOTTOM VIEW



1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections shown as bottom views
3. Measured values are from socket pin to common negative
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±(%6)% voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

DC COIL RESISTANCE VALUES UNDER ORS OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BA6	5.2Meg	0Ω	1.8Ω	0Ω	†.12K	†.14K	100Ω		
V2	12BE6	22K	1Ω	1.8Ω	0Ω	†.1800Ω	†.14K	3.3Meg		
V3	12BA6	41Ω	0Ω	1.8Ω	0Ω	†.1800Ω	†.14K	150Ω		
V4	12BF6	1Meg	43000Ω	1.8Ω	0Ω	2.4Meg	530K	†.50K		
V5	12AU7	113K	2Meg	†.45K	1.8Ω	0Ω	†.3500Ω	133K	†.38K	3.5Ω
V6	12V6GT	TP	1.8Ω	†.198Ω	†.1800Ω	950Ω	TP	0Ω	360Ω	
V7	12V6GT	TP	1.8Ω	†.21Ω	†.1800Ω	750Ω	TP	0Ω	360Ω	
V8	0Z4	0Ω	NC	230Ω	NC	21Ω	NC	TP	20K(Min)	

† MEASURED FROM PIN 8 OF V8
TP T.P. POINT
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

PHOTOFACT* Folder
*TRADE MARK

PHILCO
MODELS E-1356, E-1357, E-1358

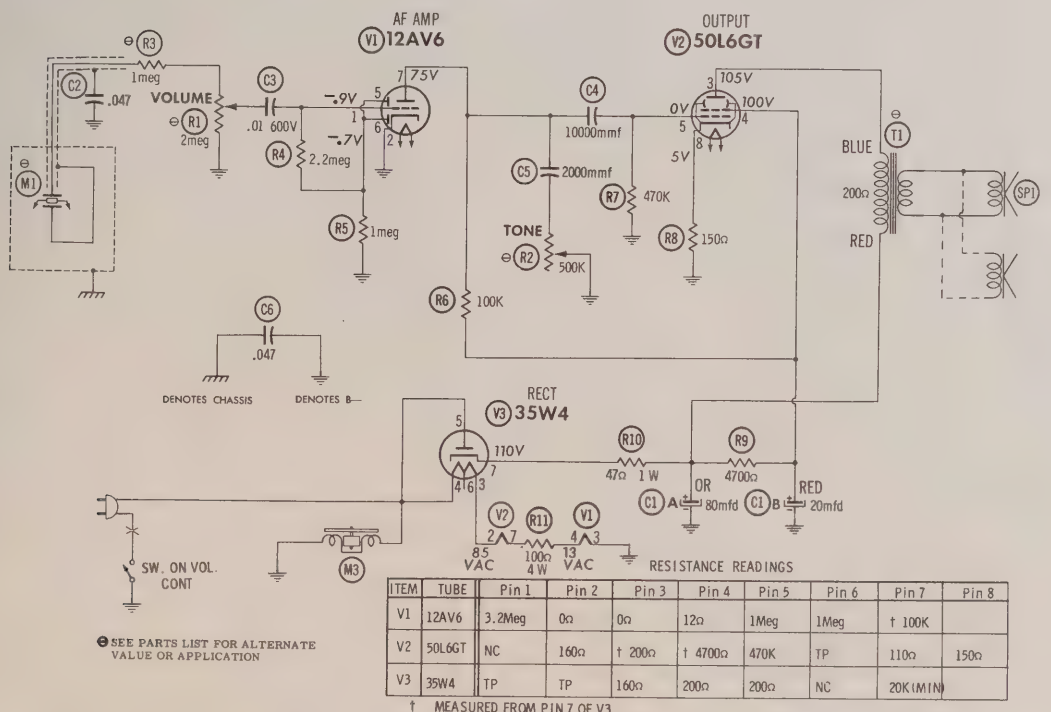
PHILCO
MODELS E-1356, E-1357, E-1358

PROPERTY OF
[illegible]
DENVER, COLORADO

PHILCO
MODELS E-1356, E-1357, E-1358

TRADE NAME	Philco Models E-1356, E-1357, E-1358
MANUFACTURER	Philco Corp., Tioga & "C" Sts. Philadelphia, Pa.
TYPE SET	AC Operated Phono Amplifier With Automatic Record Changer
TUBES (Three)	Types 12AV6 AF Amplifier, 50L6GT Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING .26 Amp. @ 117 Volts AC (26 Watts Without Motor)

MODEL E-1356 HAS 3 SPEED AUTOMATIC RECORD CHANGER - PHILCO MODEL M-38.
FOR SERVICE INFORMATION ON 4 SPEED AUTOMATIC RECORD CHANGER – PHILCO MODEL M-39 – USED IN MODELS E-1357, E-1358 – SEE PHOTOFACT SET 362 FOLDER 6.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V1	12AV6	3.2Meg	0Ω	0Ω	12Ω	1Meg	1Meg	† 100K	
V2	50L6GT	NC	160Ω	† 200Ω	† 4700Ω	470K	TP	110Ω	150Ω
V3	35W4	TP	TP	160Ω	200Ω	200Ω	NC	20K(MIN)	

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

† MEASURED FROM PIN 7 OF V3
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

376-15

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G932

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AV6	
V2	Output	50L6GT	

ITEM No.	USE	TYPE	NOTES
V3	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	30-2417-47	PRS150V8020	BBRT53215	TCT3107	TDLT-4	FMT-315	TVA-3455
B	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.047	400	30-4650-45	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C3	.01	600	30-4650-41	BPD-01	DD-103	CUB6S1	GP-10000	GEM-611	6TM-S1	
C4	10000		30-1238-2	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C5	2000		30-1238-8	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C6	.047	400	30-4650-45	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES	
	RESISTANCE	WATTS	PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.		
R1A	2Meg	½	33-5588-3	B-76	A47-2Meg-Z	Q13-139	U55	Volume	Note 1
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.		
C	Switch			KB-1	SWE-12	76-1	US-26		
R2A	500K	½	33-5587-15	B-60	A47-500K-Z	Q13-133	U48	Tone	Note 2
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.		

Note 1. Control Part No. 33-5587-22 (No Switch) Used In Models E-1357 and E-1358.
Note 2. Control Part No. 33-5587-16 Used In Models E-1357 And E-1358.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PHILCO PART No.	IRC PART No.	
R3	1Meg		66-5108340	BTS-1Meg	Note 1
R4	2, 2Meg		66-5228340	BTS-2, 2Meg	
R5	1Meg		66-5108340	BTS-1Meg	
R6	100K		66-4108340	BTS-100K	
R7	470K		66-4478340	BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PHILCO PART No.	IRC PART No.	
R8	150Ω		66-1158340	BTS-150	
R9	4700Ω		66-2478340	BTS-4700	
R10	47Ω	1	66-0474340	BTA-47	
R11	100Ω	4	33-1360-6	PW4-100	

Note 1. Models E-1357 & E-1358 use a 2, 2Meg (Part #66-5228340).

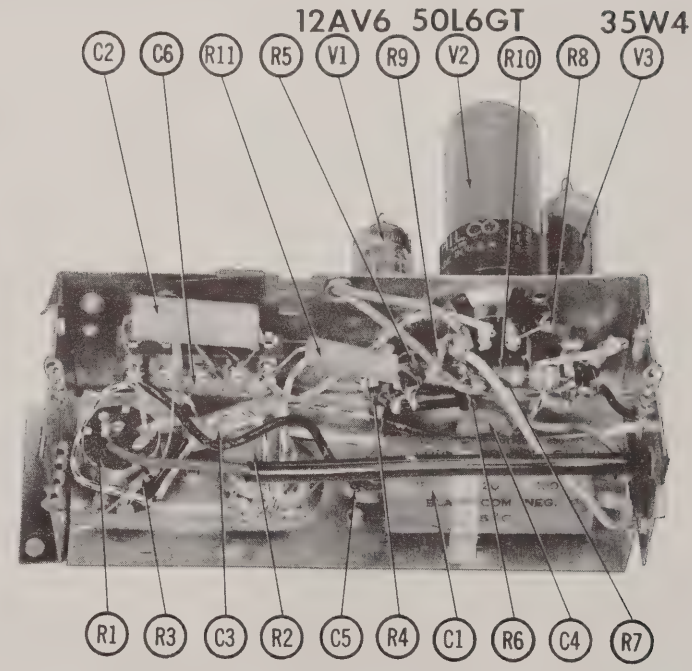
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2400Ω	3-4Ω	32-8792 ①	Z1101	A-3025	A-3332	26S58 ②	S-12X	① Used in Models E-1356, E-1357. ② Drill new mtg. hole. ③ Used in Model E-1358. ④ Bend ears down.
	2700Ω	3-4Ω	322-0054 ③	Z1101 ④	A-3025④	A-3332 ④	26S58 ④	S-12X ④	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PHILCO PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	36-1654-5 ①	4A1	① Used in Model E-1356. ② Used in Model E-1357. ③ Used in Model E-1358.
	4" x 6"	PM	3-4Ω	36-1633-12 ②		
	6"	PM		45-9766 ③		
	6"	PM		45-9766 ③		

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	PHILCO PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M1	325-8021			56	PT-1	Model E-1356
	325-8018					Models E-1357, E-1358

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	PHILCO PART No.	JENSEN PART No.	WALCO PART No.	
M2	325-8015-1 (78 RPM) 325-8015 (33 1/3-45 RPM)	† CRA55 and † CRA55LP or ♦ CRA55D and ♦ CRA55LPD	† W-64S and † W-64MGS	Model E-1356
	325-8019			Models E-1357, E-1358

† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M3	Motor		Phono

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

PILOT
MODEL AA-920B

PILOT
MODEL AA-920B

PILOT
MODEL AA-920B

TRADE NAME	Pilot Model AA-920B
MANUFACTURER	Pilot Radio Corp., 37-06 36th. St., Long Island City 1, N. Y.
TYPE SET	AC Operated 5 Channel Audio Amplifier
TUBES (Seven)	Types 12AX7 Phono Preamplifier, 12AX7 1st. AF Amplifier, 6C4 2nd. AF Amplifier, 12AU7 AF Amp. - Phase Inv., (2) 6L6GB Output, 5Y3GT Rectifier
POWER SUPPLY	105-120 Volts AC-60 Cycles RATING .92 Amp. @ 117 Volts AC (95 Watts)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1957 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

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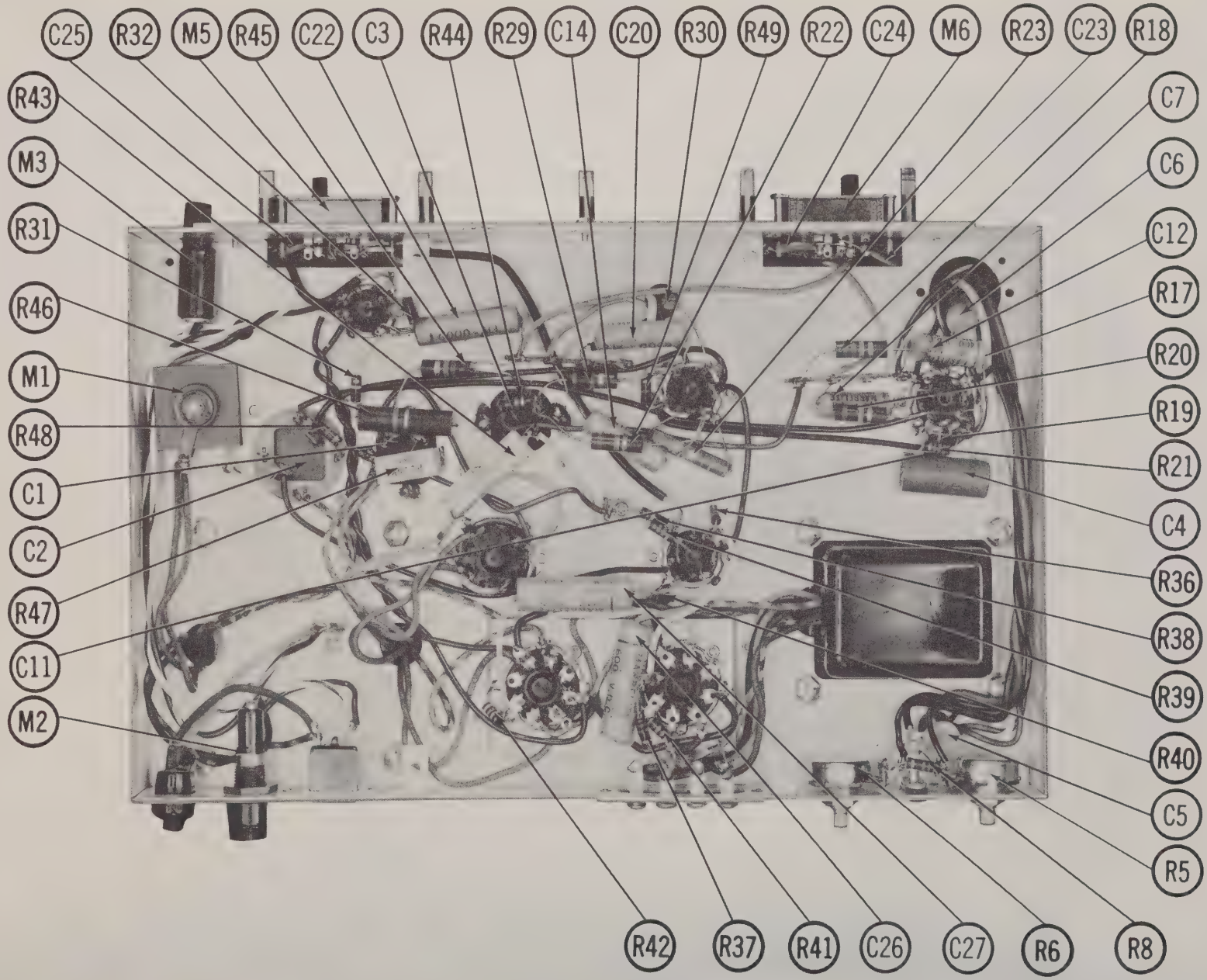
FOLDER 16



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Phono Preamplifier	12AX7	
V2	1st AF Amplifier	12AX7	
V3	2nd AF Amplifier	6C4	
V4	AF Amp. - Phase Inv.	12AU7	
V5	Output	6L6GB	
V6	Output	6L6GB	
V7	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA PILOT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▰20	450	24-149	AFH4-14	D0130	FP444	TMQ-12	Q-040	TVL-4763
B	■20	450							
C	▲20	450							
D	20	450							
C2A	▲500	35	24-135		BR2505				TVL-1330
B	▰250	35			BR5005				TVA-1312
C3A	▰10	400	24-150	AFH3-190-80	C1040	FP385	TMT-140	T-710	TVL-3754.2
B	■40	400						MT-0550	
C	▲100	50							
C4	25	25	24-50	PRS25V25	BBR25-25	TC26	TD-25-25	MT-0225	TVA-1205

FIXED CAPACITORS

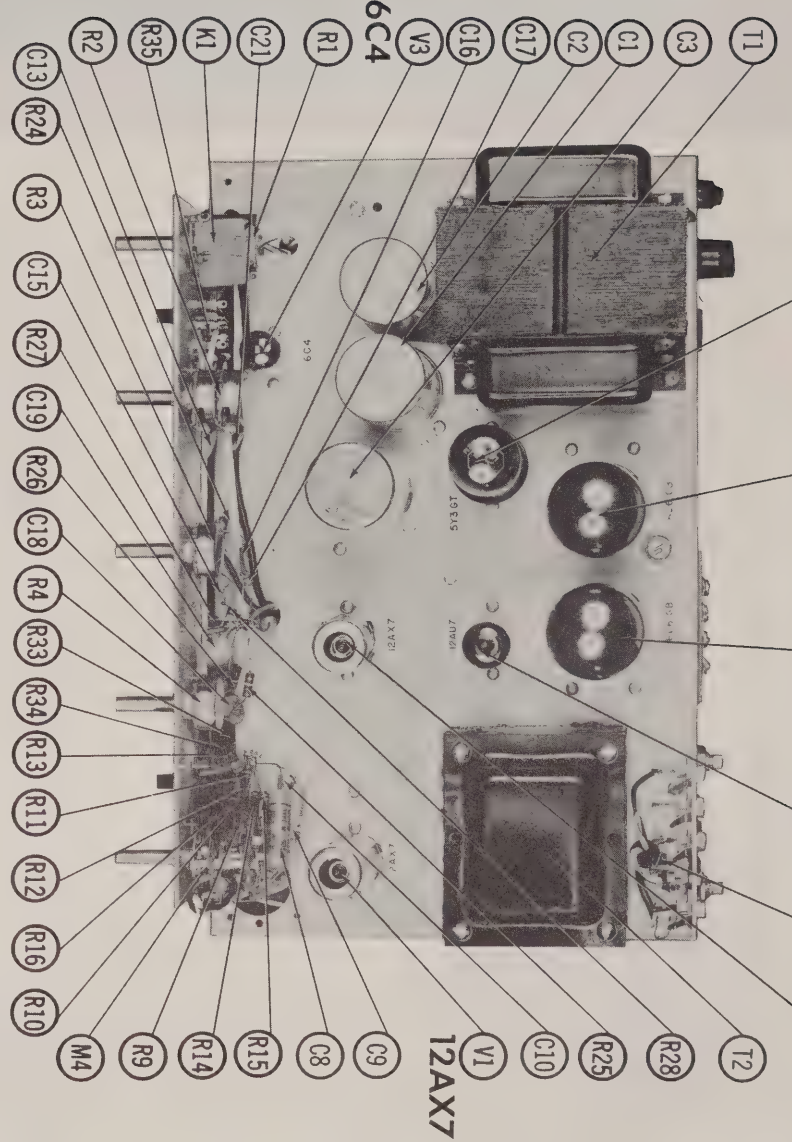
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PILOT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	250									N1500 10%
C6	.033	400		BPD-03	DF-303	CUB6S33		GEM-4133	6TM-S33	
C7	.022	400		BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C8	.022	400		BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C9	.033	400		BPD-03	DF-303	CUB6S33		GEM-4133	6TM-S33	
C10	.0051	400		BPD-005	D6-502	CUB6D5	GP-5000	GEM-625	6TM-D5	
C11	800			BPD-0008	DD-801	L10T8	ED-800		5GA-T8	
C12	.022	400		BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C13	250									N1500 10%
C14	.033	400		BPD-03	DF-303	CUB6S33		GEM-4133	6TM-S33	
C15	50				TCN-50	C10Q5U	TC7-50			N750 10%
C16	1000			1464-001		1R5D1	ED-1000		MS-21	10%
C17	4.7			NP0-SI 4.7	TCZ-4R7	C10V47C	TCO-4.7	ZT-5547	5TCCB-V47	
C18	1200			1464-0012		1R5D12			MS-212	10%
C19	.047	400		BPD-05	DF-503	CUB4S47		GEM-4147	5TM-S47	
C20	.033	400		BPD-03	DF-303	CUB4S33		GEM-4133	6TM-S33	
C21	100									N150 10%
C22	.033	600		BPD-03	DF-303	CUB6S33		GEM-6133	6TM-S33	
C23	1500			1464-0015		1R5D15			MS-215	10%
C24	1500			1464-0015		1R5D15			MS-215	10%
C25	500				D6-501	5R5T5	ED-500		MS-35	10%
C26	.047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C27	.047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PILOT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	36-66					Loudness, Tap ② 400K & 750K
B	Switch							On-Off
R2A	500K	½	36-65					Volume, Tap ② 350K
B	1Meg	½						Volume, Tap ③ 750K
R3A	5Meg	½	37-35	B-87	A47-5Meg-S	Q11-141	U67	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	5Meg	½	37-35	B-87	A47-5Meg-S	Q11-141	U67	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	1Meg	½	39-41	ABT-74	A47F5-1Meg	Q19-137X	UT-443	Phono Level, Tap ② 500K
B	Shaft			AK-1	FKS-1/4	Not Req.	Not Req.	
R6A	100K	½	39-32	B-40	A47-100K-S	Q11-128	U41	Phono Load
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PILOT PART No.	IRC PART No.	
R7	100K			BTS-100K	
R8	6800Ω			BTS-6800	
R9	27K 5%			BTS-27K 5%	
R10	220K 5%			BTS-220K 5%	
R11	68K 5%			BTS-68K 5%	
R12	82K 5%			BTS-82K 5%	
R13	330K			BTS-330K	
R14	8200Ω 5%			BTS-8200 5%	
R15	100K 5%			BTS-100K 5%	
R16	82K 5%			BTS-82K 5%	
R17	2.2Meg			BTS-2.2Meg	
R18	68K	1		BTA-68K	
R19	2.2Meg			BTS-2.2Meg	
R20	82K	1		BTA-82K	
R21	3300Ω			BTS-3300	
R22	82K	1		BTA-82K	
R23	2200Ω	1		BTA-2200	
R24	220K			BTS-220K	
R25	220K 5%			BTS-220K 5%	
R26	150K			BTS-150K	
R27	4700Ω 5%			BTS-4700 5%	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PILOT PART No.	IRC PART No.	
R28	100K 5%			BTS-100K 5%	
R29	82K	1		BTA-82K	
R30	2200Ω	1		BTA-2200	
R31	220K			BTS-220K	
R32	5600Ω			BTS-5600	
R33	1Meg			BTS-1Meg	
R34	680K			BTS-680K	
R35	470K			BTS-470K	
R36	10K			BTS-10K	
R37	6800Ω			BTS-6800	
R38	220K			BTS-220K	
R39	47K 5%			BTS-47K 5%	
R40	47K 5%			BTS-47K 5%	
R41	470K			BTS-470K	
R42	470K			BTS-470K	
R43	330Ω	4			Note 1
R44	15K			BTS-15K	
R45	27K	1		BTA-27K	
R46	22K	2		BTB-22K	
R47	100Ω	4		PW4-100	
R48	270Ω			BTS-270	
R49	270Ω			BTS-270	

Note 1. Some versions may use 240Ω 4Watt.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	PILOT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .92A	770VCT @ .105A	5VAC @ 2A	6.3VCT @ 2A SEC. 4 32VCT @ .320A	55-54					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	PILOT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5500Ω CT	16Ω Tap @ 8Ω, 4Ω	56-48						

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PILOT PART No.	REPLACEMENT DATA
K1	Tone Compensation	150MMF, 50MMF, 2500MMF, 2500MMF, 100K, 100K		

SELENIUM RECTIFIER

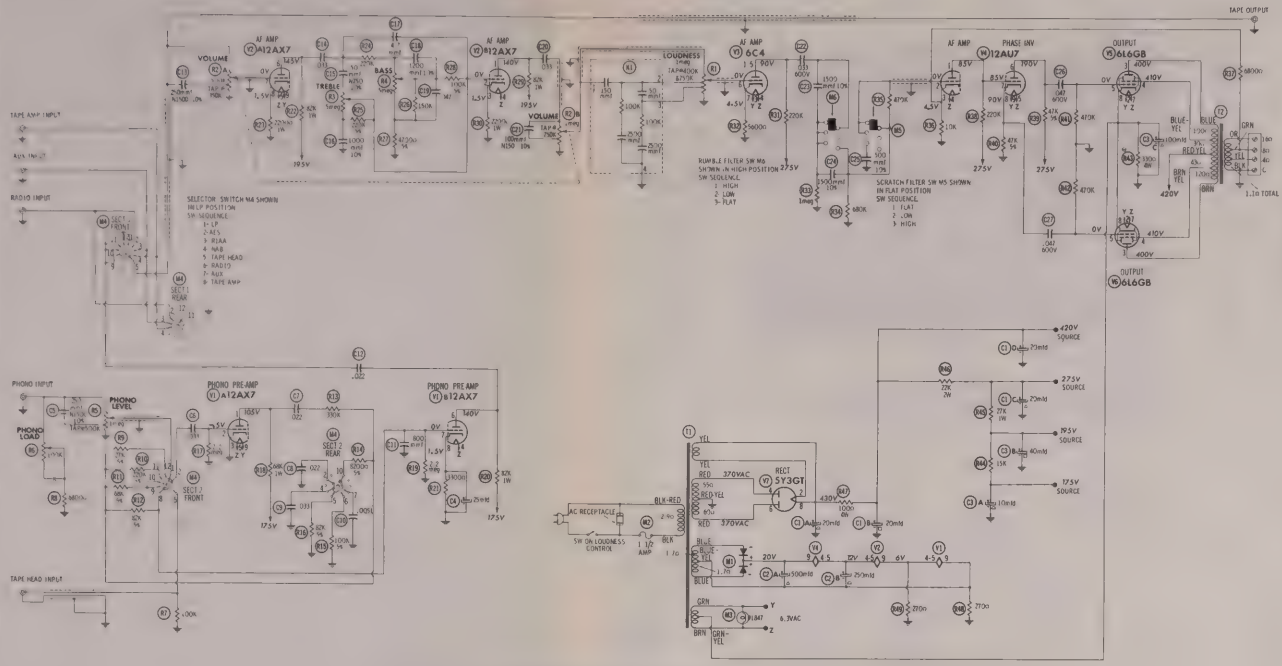
ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	PILOT PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	
M1	.3A	110-519	1017	C1B	B26G	604B	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			PILOT PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	1½A 125V S/B			31301.5 (3AG1½ S/B)	342001	MDL1½	HKP

MISCELLANEOUS

ITEM No.	PART NAME	PILOT PART No.	NOTES
M3	Pilot Light	68-10	#1847
M4	Switch	100-115	Selector (Rotary Wafer Type)
M5	Switch	101-42	Scratch Filter (Slide Type DPDT)
M6	Switch	101-42	Rumble Filter (Slide Type DPDT)



ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	↑ 130K	2.2MEG	0Ω	140Ω	140Ω	↑ 145K	130K	330KΩ	140Ω
V2	12AX7	↑ 130K	100K	220KΩ	140Ω	140Ω	↑ 130K	0Ω	220KΩ	140Ω
V3	6C4	↑ 240K	NC	330Ω	330Ω	↑ 240K	330Ω	56KΩ		
V4	12AU7	↑ 240K	680K	470Ω	140Ω	140Ω	↑ 70K	↑ 240K	47K	140Ω
V5	6L6GB	NC	330Ω	↑ 230Ω	↑ 130Ω	470K	TP	330Ω	330Ω	
V6	6L6GB	NC	330Ω	↑ 260Ω	↑ 143Ω	470K	NC	330Ω	330Ω	
V7	5Y3GT	NC	20K(MIN)	NC	55Ω	NC	80Ω	NC	20K(MIN)	

RESISTANCE READINGS

↑ MEASURED FROM PIN 8 OF V7
TP TIE POINT
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings
6. All controls at minimum, proper output load connected

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

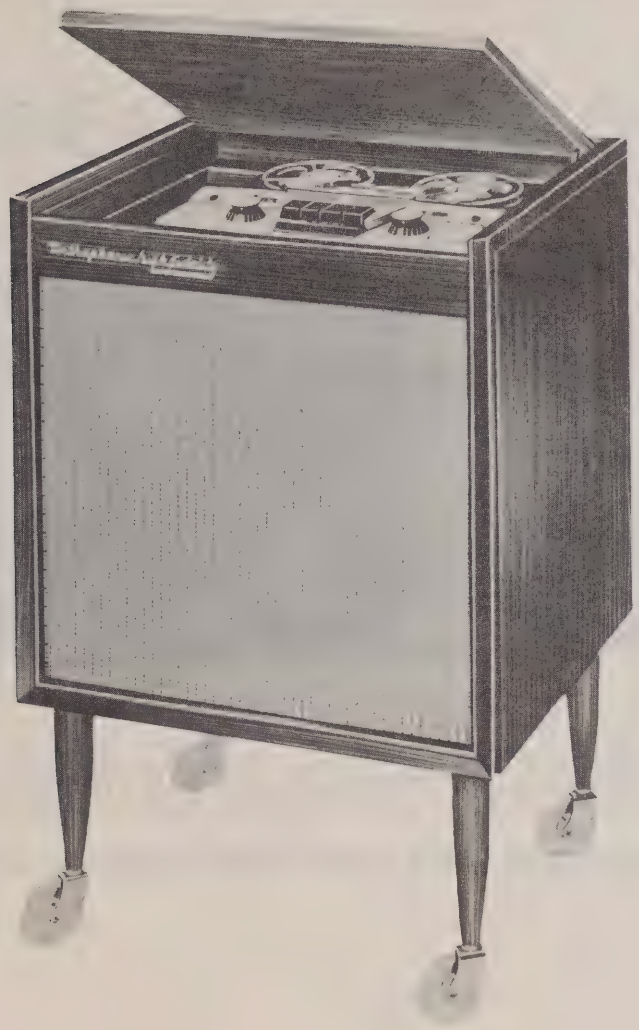
PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

RCA VICTOR
MODEL 7-TRC-1 (Ch. RS-156A)

RCA VICTOR
MODEL 7-TRC-1 (Ch. RS-156A)



RCA VICTOR
MODEL 7-TRC-1 (Ch. RS-156A)

TRADE NAME	RCA Victor Model 7-TRC-1 (Ch. RS-156A)
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 8, N. J.
TYPE SET	AC Operated Two Speed Tape Recorder
TUBES (Six)	Types 5879 Preamplifier-Bias Oscillator, 12AX7 Preamp. - AF Amp., 12AU7 Phase Inv. - Record Level Driver, (2) 6AQ5 Output, 6X4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .42 Amp. @ 117 Volts AC, 43 Watts (Without Motor)

FOR SERVICE INFORMATION ON THE TAPE TRANSPORT CHASSIS TR-2-1 — SEE RCA MODEL 7-TR-2 — PHOTOFACT SET 340 FOLDER 16.

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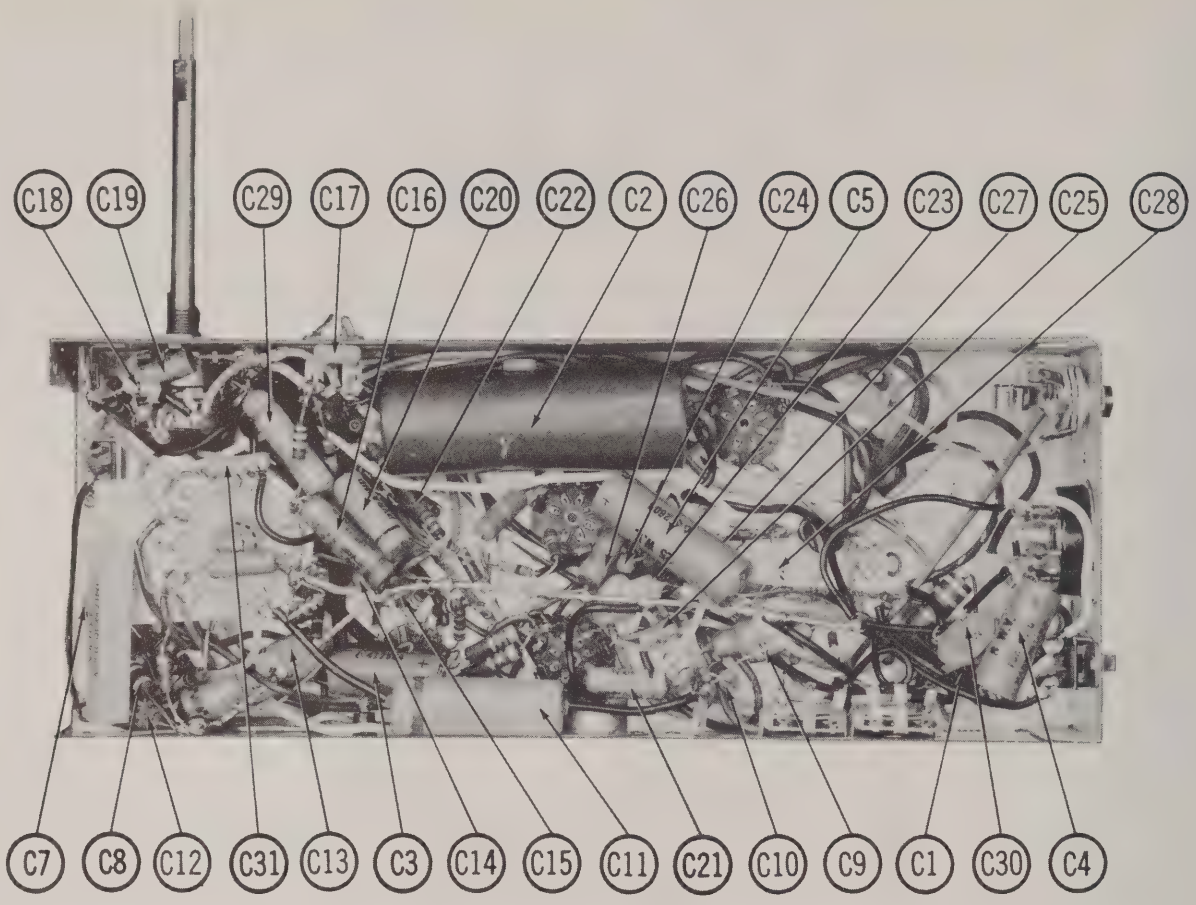
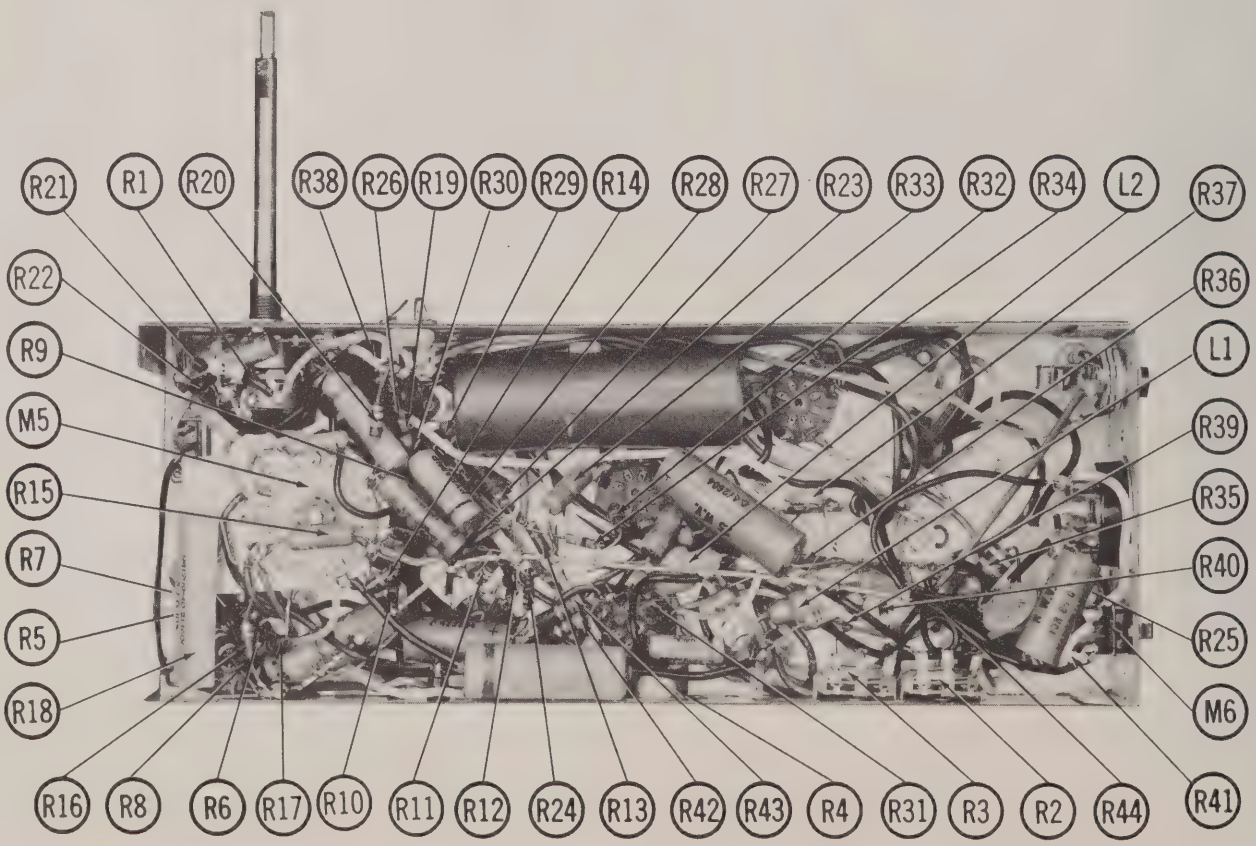
DATE 11-57 SET 376 FOLDER 17

FOLDER 17



CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS-BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamplifier-Bias Osc.	5879	
V2A	Pre Amplifier-	12AX7	
B	AF Amplifier		
V3A	Phase Inverter-	12AU7	
B	Record Level Amp.		
V4	Output	6AQ5	
V5	Output	6AQ5	
V6	Rectifier	6X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	RCA VICTOR PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■ 30	400	102427	AFH3-120		FP445		T-550	TVL-3744, 2
B	▲ 30	400				TCD78		MTD-4510	
C	30	25							
C2A	30	350	101946	PR5-175		TCT3764		D-065	R2331 *
B	10	250						MT-2512	
C	20	350							
C3	50	6	78573	SRE50V6	BBR50-6	TC29	TD-50-6	MMT-650	TVA-1100
C4	50	6	78573	SRE50V6	BBR50-6	TC29	TD-50-6	MMT-650	TVA-1100
C5	100	25	100552	PRS25V100	BBR100-25	TC2501	TD-100-25	MTH-2510	TVA-1207
C6	8	10VAC	100509	PRS10VAC8	BBR16-90 †	TC108	TD-16-150	MT-1516 †	R2201
					BBR16-90		TD-16-150	MT-1516	

† Connect negative leads together.
* Non Catalog Item.

FIXED CAPACITORS

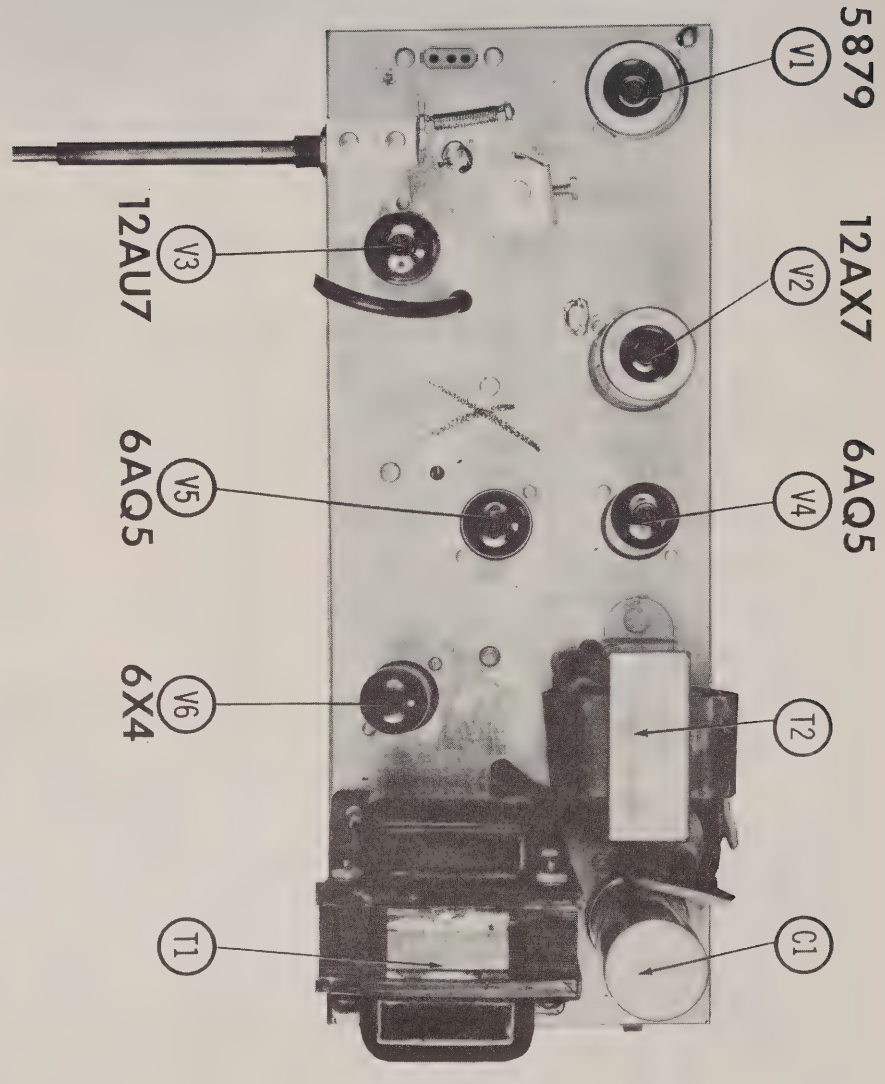
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RCA VICTOR PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C7	.01	200	73561					GEM-1611		10%
C8	390		75641		D6-391	L10T39	ED-390			10%
C9	1500		75610				ED-1500			10%
C10	270		77838		D6-271	L10T27	ED-270			10%
C11	.22	200	78905	P288N-22		CUB2P22		GEM-2022	2TM-P22	
C12	.0033	400	102425							10%
C13	.047	400	73553							10%
C14	330		76552		DC-331	L10T33	ED-330			10%
C15	.047	400	78921-A							10%
C16	.018	200	102618							10%
C17	820		102356				ED-820			10%
C18	22		101940	NP0-SI 22	D6-220	L10Q22	ED-22			10%
C19	.0015	200	102423							10%
C20	.047	400	78921-A							10%
C21	.01	400	102220					GEM-1611		10%
C22	.01	200	101000							10%
C23	1500		75610				ED-1500			10%
C24	470		75198		D6-471	L10T47	ED-470			10%
C25	470		75198		D6-471	L10T47	ED-470			10%
C26	.001	400	102426							10%
C27	.01	400	102220					GEM-1611		10%
C28	220		77460	SI 220	D6-221	LT6T22	GP-220	UC-5322	5GA-T22	
C29	.0068	400	73789							10%
C30A	4700		76470	BPD-2X0047	DD3-502	BYC6DD47	ED-0047	UC-5247	5HK-D47	
B	4700						ED-0047	UC-5247	5HK-D47	
C31	1800		74850							

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	RCA VICTOR PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	250K	½	101716				UE1377	Tone
B	1Meg	½						Volume, Tap @ 250K
R2	1Meg	½	102421					Overload (Record Level)
R3	1Meg	½	102421					Normal (Record Level)
R4	100Ω	2	102422					Hum Balance (Wire Wound)

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA VICTOR PART No.	IRC PART No.	
R5	27K		502327	BTS-27K	
R6	47K		502347	BTS-47K	
R7	1.5Meg		502515	BTS-1.5Meg	
R8	3300Ω		502233	BTS-3300	
R9	27K		502327	BTS-27K	
R10	1Meg		502510	BTS-1Meg	
R11	390K		502439	BTS-390K	
R12	180K		502418	BTS-180K	
R13	22K		502322	BTS-22K	
R14	68K		502368	BTS-68K	
R15	33K	1	512333	BTA-33K	
R16	15K		502315	BTS-15K	
R17	470K		502447	BTS-470K	
R18	3.3Ω	7	102424		
R19	100K		502410	BTS-100K	
R20	68K		502368	BTS-68K	
R21	820K		502482	BTS-820K	
R22	100K		502410	BTS-100K	Note 1
R23	220K		502422	BTS-220K	
R24	2700Ω		502227	BTS-2700	
R25	3300Ω		502233	BTS-3300	
R26	56K		502356	BTS-56K	
R27	22K		502322	BTS-22K	
R28	27K		502327	BTS-27K	
R29	47K		502347	BTS-47K	
R30	2700Ω		502227	BTS-2700	
R31	220K		502422	BTS-220K	
R32	220K		502422	BTS-220K	
R33	270Ω	1	512127	BTA-270	
R34	10K		502310	BTS-10K	
R35	470Ω	2	522147	BTB-470	
R36	100K		502410	BTS-100K	
R37	270K		502427	BTS-270K	
R38	100K		502410	BTS-100K	
R39	100K		502410	BTS-100K	
R40	100K		502410	BTS-100K	
R41	5600Ω		502256	BTS-5600	
R42	8.2Ω 5%		101852		
R43	8.2Ω 5%		101852		
R44	100K		502410	BTS-100K	

Note 1. Some versions may use 68K.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	RCA VICTOR PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .42A	480VCT @ .067A	6.3VAC @ 2.5A		101849	P9212	P-3147	PC-8419	24R00U	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	RCA VICTOR PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	8500Ω CT	3.2Ω	101848						

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	RCA VICTOR PART No.	QUAM PART No.	
SP1	8"	PM	3-4Ω	78597 ①	8A31	① Parallel and Phase
SP2	3½"	PM	6-8Ω	100465 ①	3A15TZ6.6	
SP3	3½"	PM	6-8Ω	100465 ①	3A15TZ6.6	

COILS

ITEM No.	USE	REPLACEMENT DATA				NOTES
		RCA VICTOR PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Bias Osc.	101722				8 Millihenries
L2	Trap Coil	101722				8 Millihenries

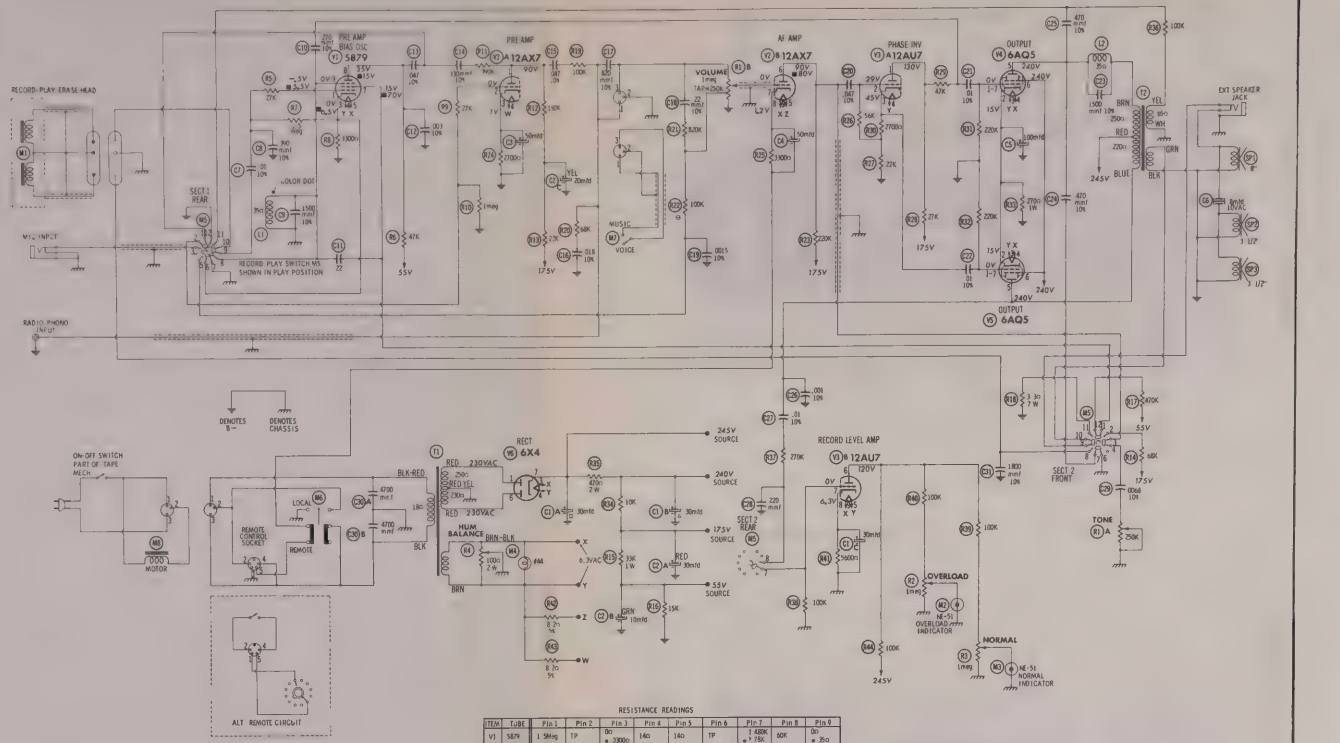
MISCELLANEOUS

ITEM No.	PART NAME	RCA VICTOR PART No.	NOTES
M1	Head	101494	Record-Play-Erase
M2	Neon Lamp	101857	Indicator Neon Type #51
M3	Neon Lamp	101857	Indicator Neon Type #51
M4	Pilot Light	11891	#44
M5	Switch	101850	Record-Play (Rotary Wafer Type)
M6	Switch	101856	Remote-Local (Slide Type DPDT)
M7	Switch	101870	Voice-Music (Slide Type SPST)
M8	Motor	101461	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	101704	On-Off-Speed
Knob	101706	Tone
Knob	101705	Volume



● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	5879	1 5Meg	TP	0Ω ± 330Ω	1kΩ	1kΩ	TP	↑ 488K ± ↑ 78K	60K	0Ω ± 35Ω
V2	12AX7	↑ 213K	1Meg	270Ω	1kΩ	1kΩ	↑ 230K ↑ ± 60K	0Ω	330Ω	1kΩ
V3	12AU7	↑ 33Y	78K	25K	1kΩ	1kΩ	↑ 25K	100K	560Ω	1kΩ
V4	6AQ5	220K	270Ω	1kΩ	1kΩ	↑ 285Ω	↑ 470Ω	220K		
V5	6AQ5	220K	270Ω	1kΩ	1kΩ	↑ 220Ω	↑ 470Ω	220K		
V6	6X4	250Ω	NC	1kΩ	1kΩ	NC	230Ω	200(Min)		

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED
↑ MEASURED FROM PIN 7 OF V6
± MEASURED IN "RECORD" POSITION
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance of component values makes possible a variation of ±10% in voltage and resistance readings
6. All controls at minimum, proper output load connected

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

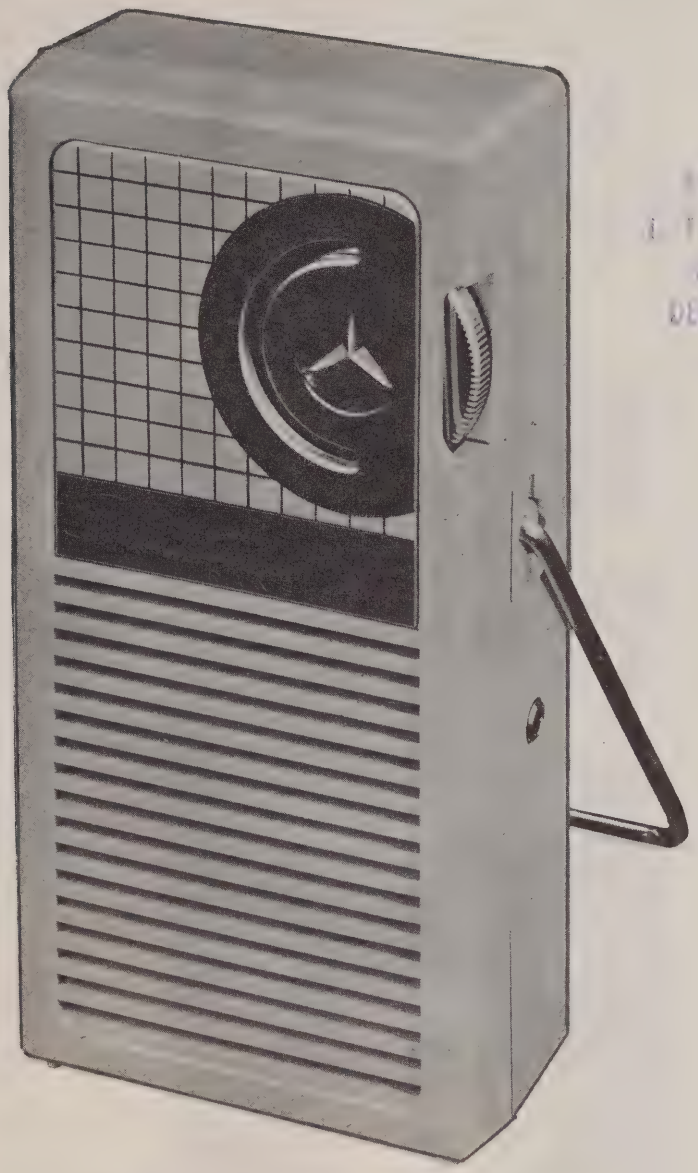
PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

SILVERTONE
MODELS 8204, 8206 (Ch. 132.42500)

SILVERTONE
MODELS 8204, 8206 (Ch. 132.42500)



PROPERTY OF
DENVER, COLORADO

SILVERTONE
MODELS 8204, 8206 (Ch. 132.42500)

TRADE NAME	Silvertone Models 8204, 8206 (Ch. 132.42500)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	9 Volts DC
RATING	20MA @ 9 Volts DC
TUNING RANGE—BROADCAST	540KC - 1670KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to Antenna Stator Lug on tuning gang. Low side to B-	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output.
2.		Loop	1670KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A5	"

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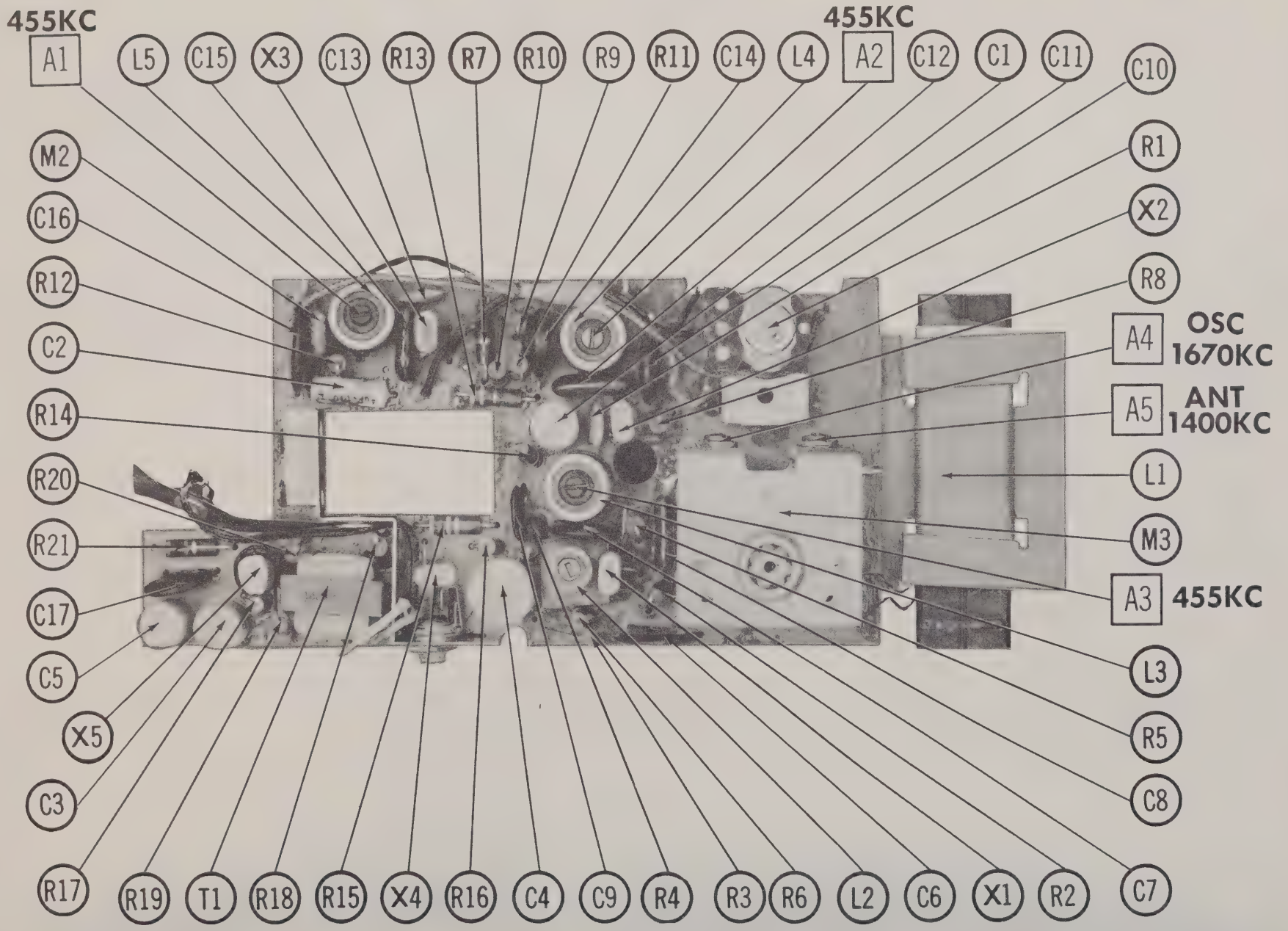
H175

FOLDER 18



CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N212	Converter		2N212	2N212	
X2	2N94	1st IF Amplifier			2N94	
X3	2N94	2nd IF Amplifier			2N94	
X4	2N35	Driver			2N35	
X5	2N321	Output			2N383	Alternate Type: 2N241A or 2N270

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	10	10	44279-6	XPP10V10	NL10-10	TT12X10	ML10-15		TE-1114
C2	4	10	44396-1	XPP10V4	NL5-15	TT12X5	ML4-15		
C3	10	10	44279-6	XPP10V10	NL10-10	TT12X10	ML10-15		TE-1114
C4A	80	10	44397-2						
B	80	10							
C5	80	10	44279-7	PWE10V100	NL100-10				

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	50000		44684-2	BPD-05					TG-S50	
C7	10000		44684-8	BPD-01	DD-103	BYA6S1	ED-01	DC511	TG-S10	
C8	680		44398-681	1467-00068	D6-681	1W5T68	ED-680	UC-5368	1FM-368	
C9	20000		44684-7	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C10	16		43957-7							
C11A	20000		44684-4	BPD-2X02	DD-203	BYB6S2	ED-02		5HK-2S2	
B	20000				DD-203	BYB6S2	ED-02			
C12	470		44396-471	1467-00047	D6-471	5W5T47	ED-470	UC-5347	1FM-347	
C13	27		43957-9							
C14A	20000		44684-4	BPD-2X02	DD-203	BYB6S2	ED-02		5HK-2S2	
B	20000				DD-203	BYB6S2	ED-02			
C15	680		44398-681	1467-00047	D6-681	1W5T68	ED-680	UC-5368	1FM-368	
C16	50000		44684-2	BPD-05					TG-S50	
C17	100000		44684-6						TG-P10	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2200Ω	1/4	45000-2					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R2	3900Ω 5%		22382-392	BTS-3900 5%	
R3	68K 5%		22382-683	BTS-68K 5%	
R4	8200Ω		22381-822	BTS-8200	
R5	22Ω		22381-220	BTS-22	
R6	1500Ω		22381-152	BTS-1500	
R7	1000Ω		43689-102	BTS-1000	
R8	820Ω 5%		22382-821	BTS-820 5%	
R9	2200Ω		22381-222	BTS-2200	
R10	39K		22381-393	BTS-39K	
R11	1000Ω		22381-102	BTS-1000	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R12	220Ω		20061-221	BTS-220	
R13	3300Ω 5%		44052-332	BTS-3300 5%	
R14	47K 5%		22382-473	BTS-47K 5%	
R15	47K		43689-473	BTS-47K	
R16	4700Ω		22381-472	BTS-4700	
R17	4700Ω		22381-472	BTS-4700	
R18	470Ω		22381-471	BTS-470	
R19	12K		22381-123	BTS-12K	
R20	3300Ω 5%		22382-332	BTS-3300 5%	
R21	100Ω 5%		44052-101	BTS-100 5%	

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	612Ω	17Ω	44858	GH105			TR-20		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	2 3/4"	PM	17Ω	44280		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	44511-2			2007	
L2	Osc. Coil	44383-3				
L3	1st IF	44855-1			9-C1	
L4	2nd IF	44855-2			9-C2	
L5	3rd IF	44855-3			9-C2	

BATTERIES

ITEM No.	VOLTAGE	SILVERTONE PART No.	REPLACEMENT DATA								NOTES
			BURGESS		EVEREADY		MALLORY		RAY-O-VAC		
			"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V			P6		226		M1600		1600	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		SILVERTONE PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N295 1N64G ①		1N60	1N34A	Audio Detector ① Alternate Type

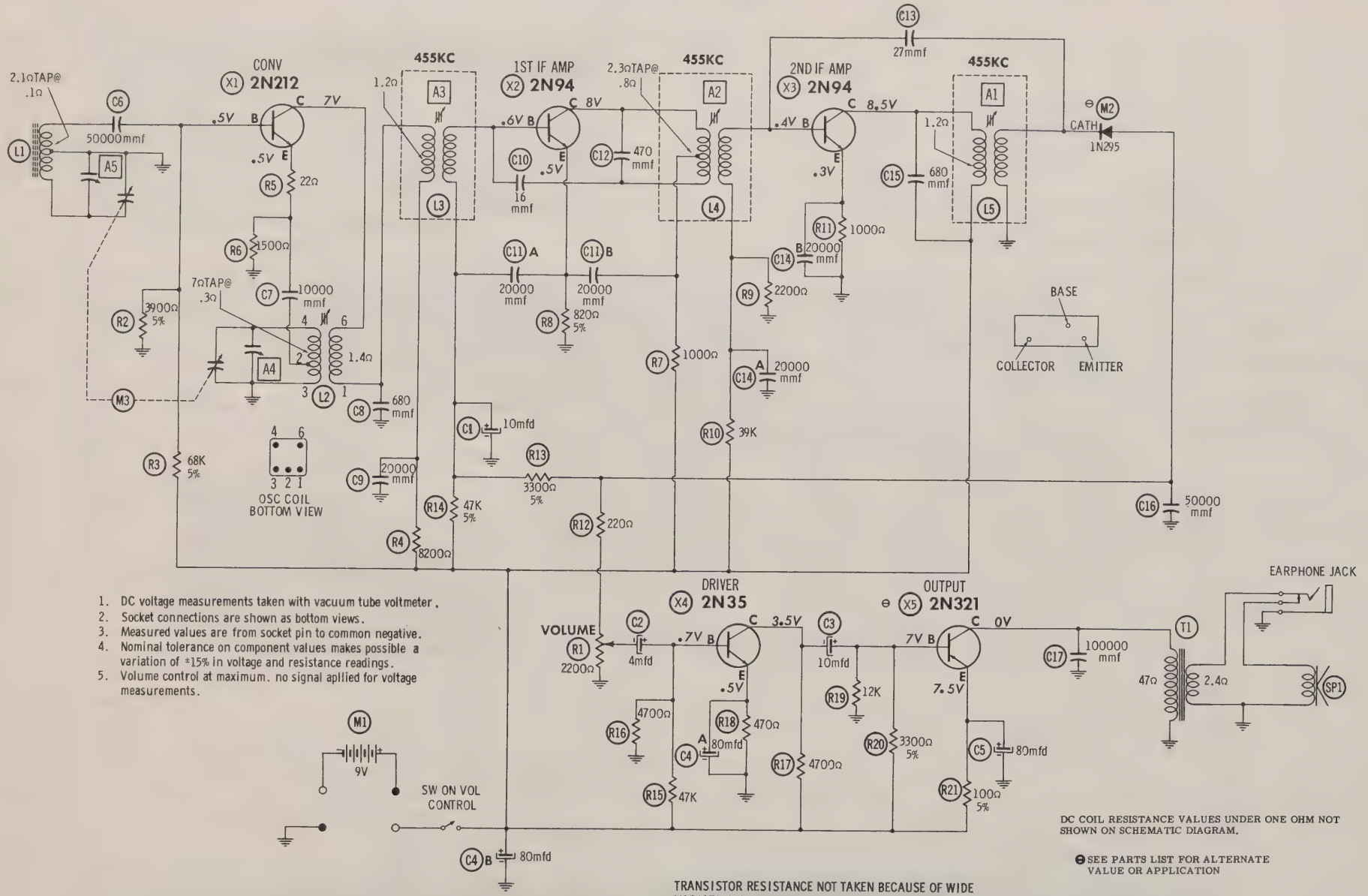
MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Tuning Cap.	44730	Two Gang (Ant. 12-140MMF, Osc. 18-100MMF)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	44728-59	On-Off-Volume (Gray)
Knob	44728-83	On-Off-Volume (Coral)
Knob	44915	Tuning
Cabinet	44875-59	Includes Front, Back & Escutcheon (Gray)
Cabinet	44875-83	Includes Front, Back & Escutcheon (Coral)



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal apllied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

TRANSISTOR RESISTANCE NOT TAKEN BECAUSE OF WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

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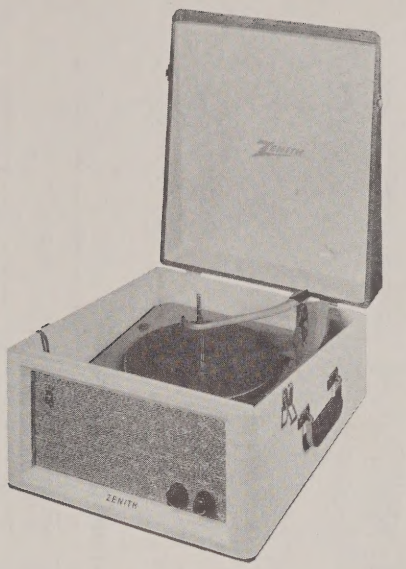
*TRADE MARK

RETMA MEMBER

ZENITH MODEL ZP8L

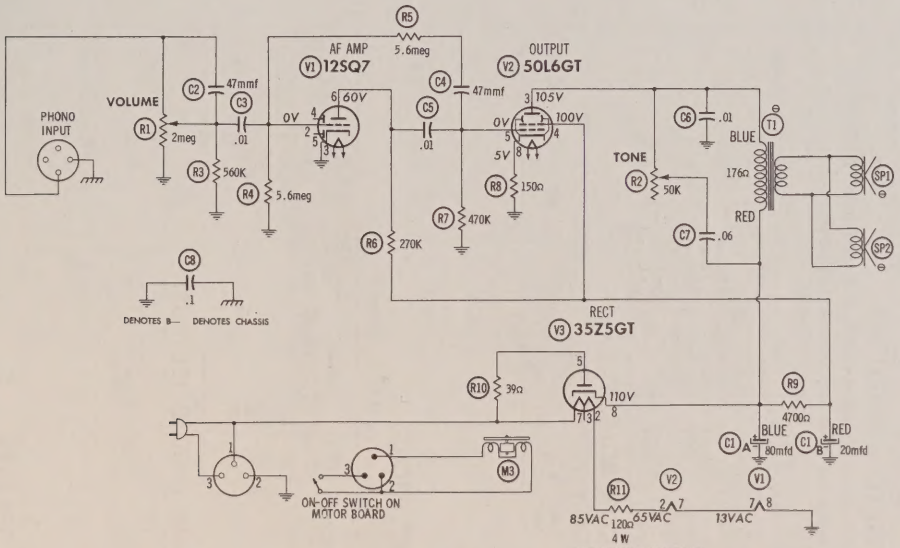


PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ZENITH MODEL ZP8L

TRADE NAME	Zenith Model ZP8L
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Three)	Types 12SQ7 AF Amplifier, 50L6GT Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .25 Amp. @ 117 Volts AC (25 Watts Without Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #S-14074 OR S-14077 — SEE SIMILAR V-M MODEL 1200A — PHOTOFACT SET 353 FOLDER 16.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V1	12SQ7	0Ω	5.6Meg	0Ω	NC	NC	† 275K	12Ω	0Ω
V2	50L6GT	NC	58Ω	† 176Ω	† 4700Ω	470K	TP	12Ω	150Ω
V3	35Z5	NC	180Ω	NC	TP	240Ω	NC	210Ω	20K (MIN)

† MEASURED FROM PIN 8 OF V3.
TP TIE POINT.
NC NO CONNECTION.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

376-19

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12SQ7	
V2	Output	50L6GT	
V3	Rectifier	35Z5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	WC12018	PRS150V8020	BBRT44215	TCT3116	TDLD-10	FMT-315	TVA-2460
B	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	47		22-2466	BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C3	.01	200	22-1843	BPD-01	DD-103	CUB2S1	GP-10000	GEM-411	2TM-S1	
C4	47		22-2466	BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C5	.01	200	22-1843	BPD-01	DD-103	CUB2S1	GP-10000	GEM-411	2TM-S1	
C6	.01	200	22-1843	BPD-01	DD-103	CUB2S1	GP-10000	GEM-411	2TM-S1	
C7	.06	200	22-1744	P288N-06		CUB6S6		GEM-616	6TM-S6	
C8	.1	200	22-2780	P288N-1	DF-104	CUB2P1		GEM-401	2TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2Meg	½	WC12017	B-76			U55	Volume
B	Shaft			Not Req.			Not Req.	
C	Bushing			AK-26			EB-158	
R2A	50K	½	WC11507	B-32			U33	Tone
B	Shaft			Not Req.			Not Req.	
C	Bushing			AK-26			EB-158	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R3	560K			BTS-560K	
R4	5.6Meg			BTS-5.6Meg	
R5	5.6Meg			BTS-5.6Meg	
R6	270K			BTS-270K	
R7	470K			BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R8	150Ω			BTS-150	
R9	4700Ω			BTS-4700	
R10	39Ω			BTS-39	
R11	120Ω	4			

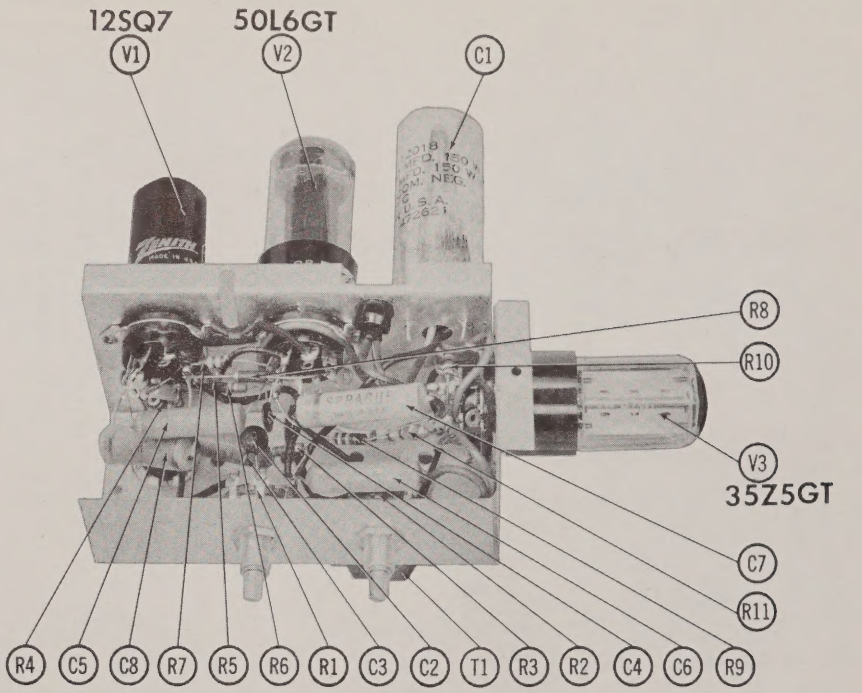
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4600Ω	1.6Ω	WC12221 ①	Z1001 ② ③	A-2902 ②	A-3849 ②	24S61 ② ③	S-53X ② ③	① Alternate Part #95-1404 ② Drill new mtg. hole. ③ Tape center tap on primary winding.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	WC11792 ①	4A07	① Alternate Part #49-750
SP2	4"	PM	3-4Ω	WC11792 ①	4A07	

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	ZENITH PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M1	142-80			56	* PT-1	* Not required unless original mounting bracket is damaged.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	ZENITH PART No.	JENSEN PART No.	WALCO PART No.	
M2				

MISCELLANEOUS

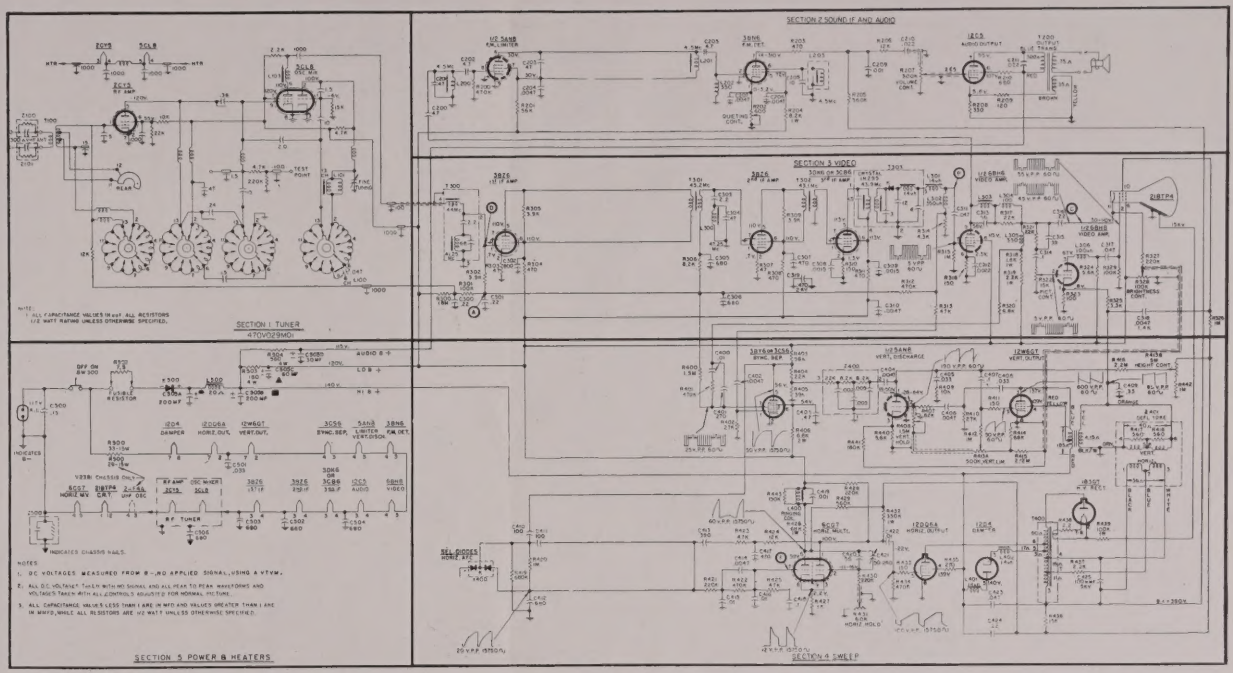
ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Motor		Phono

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

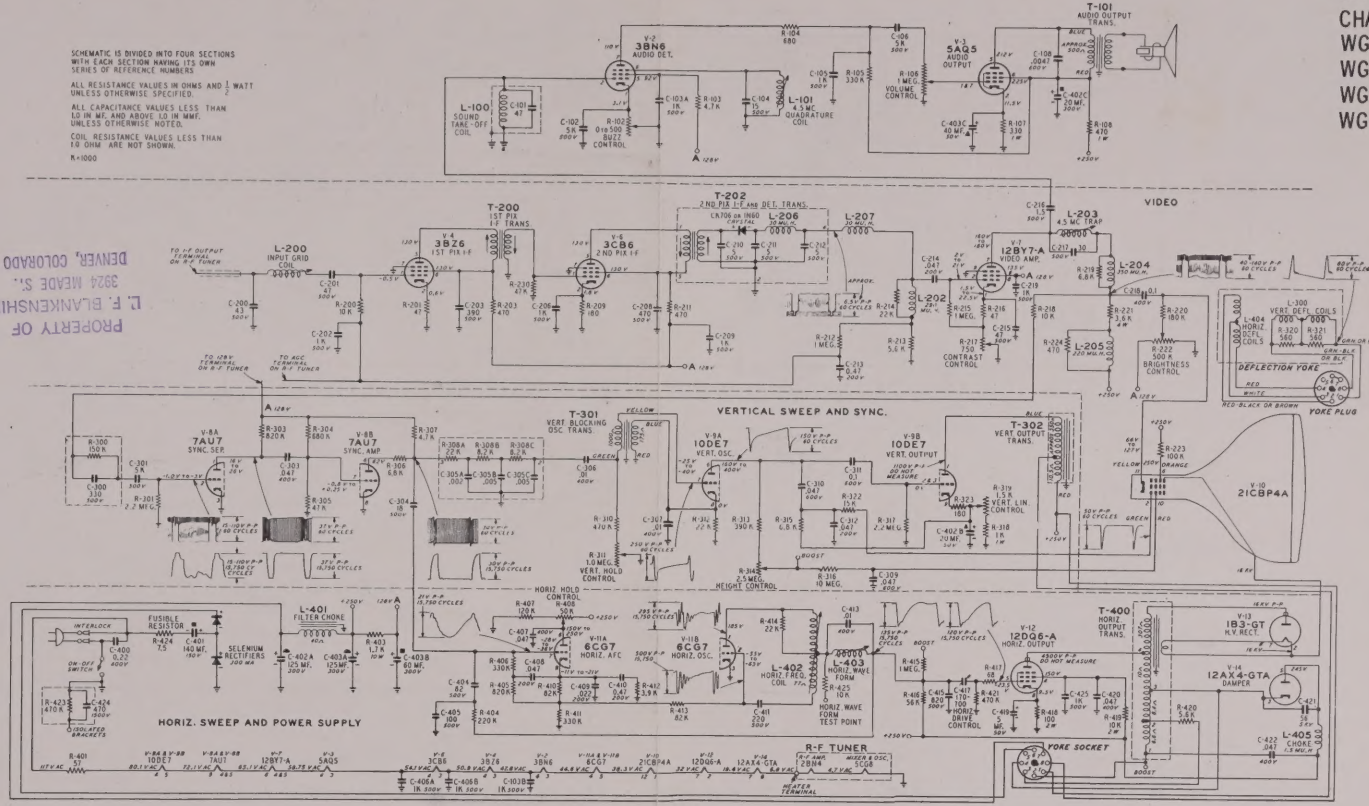
NAME	PART NO.	DESCRIPTION
Knob	WC12126-3E	Control, 2 Used
Handle	WC11845	
Case	WC12339	

WESTINGHOUSE MODELS	CHASSIS
H21T201B	V-2371-22
H21T202B	"
H21K204B	"
H21K205B	"
H21T201	V-2371-24
H21T202	"
H21K204	"
H21K205	"
H21K212	V-2371-29
H21K213	"
H21K214	"
H21K215	"
H21K216	"
H21KU212	V-2381-202
H21KU213	"
H21KU214	"
H21KU215	"
H21KU216	"
H21TU201	V-2381-202
H21TU202	"
H21KU204	"
H21KU205	"
H21KU212A	V-2381-204
H21KU213A	"
H21KU214A	"
H21KU215A	"
H21KU216A	"



SCHEMATIC COURTESY OF
WESTINGHOUSE ELECTRIC CORP.

AIRLINE MODELS CHASSIS WG-4041A WG-4051A WG-5041A WG-5051A


SCHEMATIC IS DIVIDED INTO FOUR SECTIONS WITH EACH SECTION HAVING ITS OWN SERIES OF REFERENCE NUMBERS
ALL RESISTANCE VALUES IN OHMS AND 1/2 WATT UNLESS OTHERWISE SPECIFIED.
ALL CAPACITANCE VALUES LESS THAN 1.0 IN MF. AND ABOVE 1.0 IN MMF. UNLESS OTHERWISE NOTED.
COIL RESISTANCE VALUES LESS THAN 1.0 OHM ARE NOT SHOWN.
K=1000
V-2 3BN6 AUDIO DET.
V-3 5AQ5 AUDIO OUTPUT
T-101 AUDIO OUTPUT TRANS.
L-100 SOUND TAKE-OFF COIL
L-101 4.5 MC QUADRATURE COIL
R-108 1 MEG. VOLUME CONTROL
R-102 0 to 500 BUZZ CONTROL
VIDEO
T-200 1ST PIX I-F TRANS.
T-202 2ND PIX I-F AND DET. TRANS.
L-200 INPUT GRID COIL
V-4 3BZ6 1ST PIX I-F
V-5 3CB6 2ND PIX I-F
L-206
L-207
V-1 12BY7-A VIDEO AMP.
L-203 4.5 MC TRAP
L-204
L-205
L-202
R-217 750 CONTRAST CONTROL
R-222 500 BRIGHTNESS CONTROL
L-300 VERT. DEFL. COILS
DEFLECTION YOKE
YOKE PLUG
PROPERTY OF E. F. BLANKENSHIP 3824 MEADE ST., DENVER, COLORADO
VERTICAL SWEEP AND SYNC.
V-8A 7AU7 SYNC. SER.
V-8B 7AU7 SYNC. AMP.
T-301 VERT. BLOCKING OSC. TRANS.
V-9A 10DE7 VERT. OSC.
V-9B 10DE7 VERT. OUTPUT
T-302 VERT. OUTPUT TRANS.
V-10 21CBP4A
HORIZ HOLD CONTROL
HORIZ. SWEEP AND POWER SUPPLY
L-401 FILTER CHOKE
SELENIUM RECTIFIERS
V-11A 6CG7 HORIZ. AFC
V-11B 6CG7 HORIZ. OSC.
L-402 HORIZ. FREQ. COIL
L-403 HORIZ. WAVE FORM
V-12 12DQ6-A HORIZ. OUTPUT
T-400 HORIZ. OUTPUT TRANS.
V-13 1B3-GT H.V. RECT.
V-14 12AX4-GTA DAMPER
L-405 CHOKE
YOKE SOCKET
R-F TUNER
HEATER TERMINAL

SCHEMATIC COURTESY OF MONTGOMERY WARD & CO.

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